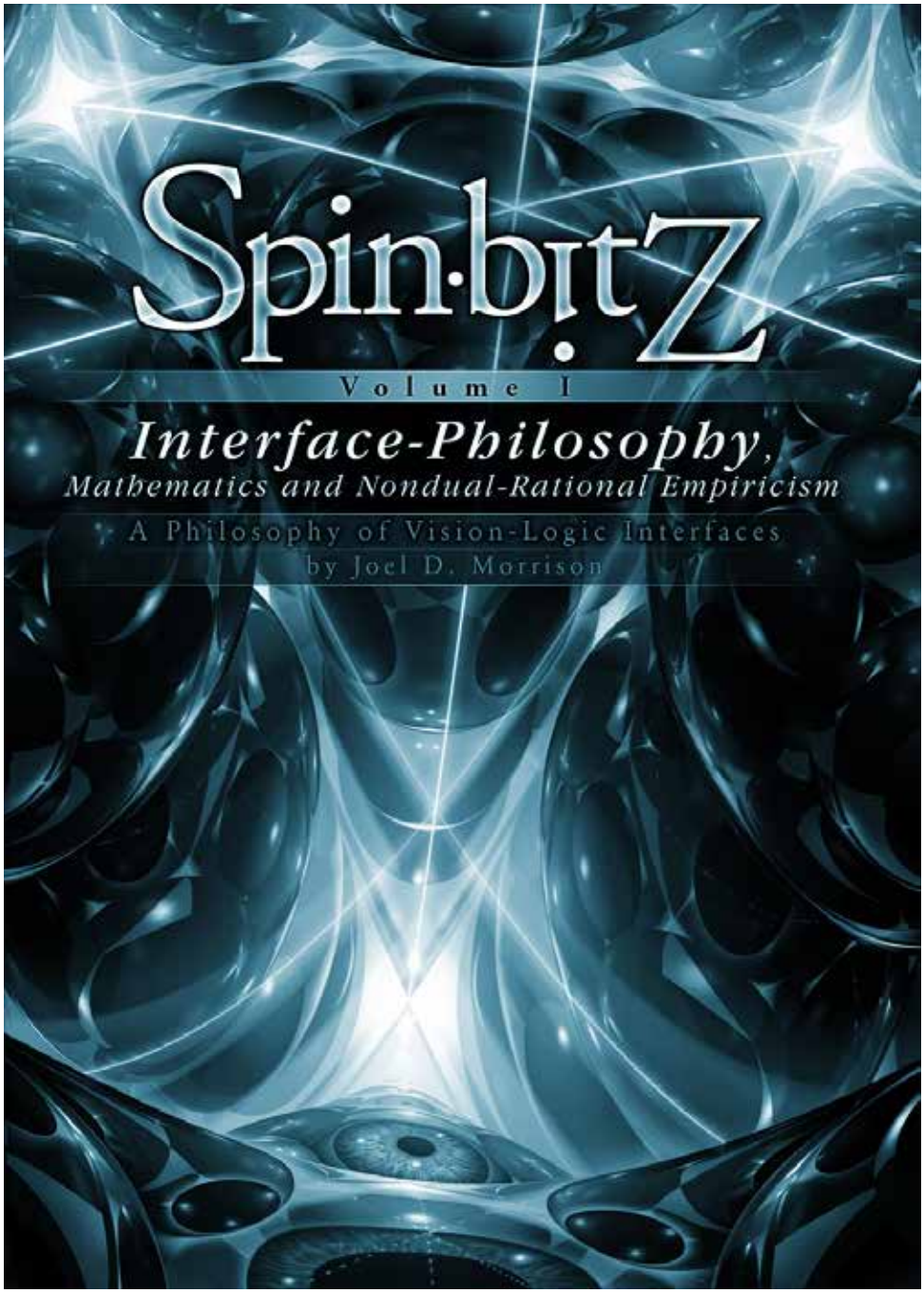
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Volume I
Interface-Philosophy,
Mathematics and Nondual-Rational Empiricism
A Philosophy of Vision-Logic Interfaces
by Joel D. Morrison

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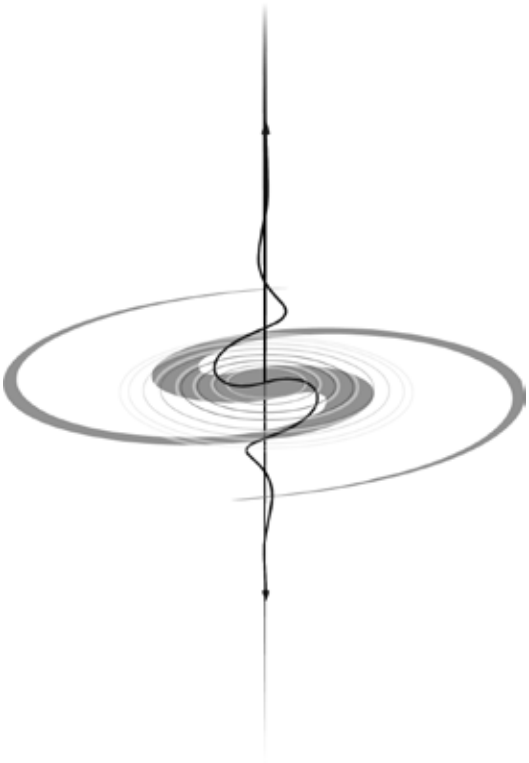
Volume I:

Interface-Philosophy, Mathematics and Nondual Rational-Empiricism

A Philosophy of Vision-Logic Interfaces

Joel D. Morrison



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Thus it is said:
The path into the light seems dark,
...
The Tao is nowhere to be found.
Yet it nourishes and completes all things.

—Lao-Tzu, *Tao Te Ching*

... dedicated to my three-year-old son Grey and to the octogenarian Gerald Lebau, the two best teachers an eternal student could ask for ... and to all those unafraid to look for the light in dark places.

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A NOTE TO THE READER

> *'The lotus blossom will unfold as we progress,' or some such thought.* — Gerald I. Lebau

This is a highly collaborative work, drawing, often unconsciously, on many sources both known and unknown and working at many levels, across many disciplines spanning nearly the whole spectrum of human knowledge and ideas. The net is cast wide, but as such it cannot possibly hit all relevant points in-between, and it also cannot penetrate with equal depth into all its points of contact. The vast depth and complexity of these systems of human thought makes the construction of the linear linguistic interface between them seem like (in the words of Stanislaw Lem) "giving birth to a leviathan through the eye of a needle—which turns out to be possible, if the leviathan is sufficiently reduced. But then the leviathan looks like a flea. Such are my problems when I try to adapt [this emergent system of living concepts] to … language."[i]

Writing such a book is like skinning an 11-headed dragon into one long and thin strip of leathery scales. How can one retain the iridescent living beauty and patterning of the scales? Or the elegant curvature and serpentine motions of the intertwining necks? Or the form of the musculature in the legs, torso and arms? … To strip away the metaphor, how can one retain the emergent structure and inter-connective synergetic harmony of the simultaneous actions of hundreds of billions of nerve-cells and electro-chemical gradients as they emerge into the higher-level thought-patterns that make up this living system of concepts if one reduces it to a single, long line of alpha-numeric text which the reader must transcode and attempt to bring to life, bit by tiny bit? Can I effectively convey the broad simultaneous network of interconnected ideas after it is run through the spaghetti machine of human language? This question, at the interface of

[i] (Lem, Imaginary Magnitudes, Golem XIV), oooh such grandiosity to take the perspective of Golem XIV, but its resonance to our human nature provides such a clear line of departure, illustrating the holarchical nature between deep embodied semantics and higher-level syntax.

communication itself, depends as much on the reader as it does on the writer.

As Gerald Lebau so eloquently stated in the preface to his 1965 work, *The Nature of Matter and Energy*:

> All in all, this is a highly interconnected and interdependent set of concepts. No one part can be fully understood until all of it has been finished. The reader's patient indulgence is urgently requested. The major intellectual effort required to complete the book should be most adequately rewarding.

Ultimately, we have to progress linearly in unfolding this complex nonlinear system, so our communication depends critically on the patience of the reader to allow the nonlinear intuition of critical underlying concepts and contexts—that have not yet been given their time on the stage—to naturally and fully emerge. As Deleuze might say, the reader must allow the "plane of consistency" in the text to fully arise, lest a premature criticism enforce a false reading in this highly inadequate linear method of communication.

To this end I have attempted to give as much nonlinearity as possible to the construction. I have supplied many visual diagrams, and I have tried to format the book hierarchically by subject, and sequentially by generality—from the general to the specific—and have given cross-references (and hyperlinks for the ebook format) where possible (see the back of the book for formatting specifics). The book should unfold adequately for most readers in the sequential format, but it can also be approached nonlinearly by subject—jumping to new subjects or levels of generality/specificity as needed, in order to explore, or give context to the current position on the chosen nonlinear trajectory.

My only wish is that this book be enjoyed, because only if it is enjoyed will it be understood. Let the dialogue unfold as you, the creative reader, see fit. If it is not fun following a sequential format, then by all means skip around. Hopefully the formatting and style of the book will be adequately accommodating.

PRELUDE: SPELL-BINDING

...
stone-walled into compartments
form is stolen from potential
like the exoskeleton of a new insect
liberating protoplasm to wander
into the labyrinthine tomb of its own hardening limbs.

the chitinous infant now begins to crawl
single-file and into battle.

on the field is found every form of armor
concealing identity
dividing unity into multiplicity—

beneath them all, breathing calmly ... in time ...
the singular form awaits conception.

At the beginning of the twenty-first century, we stand at an historical fault-line between vast, colliding monoliths of thought. These living fossils rise and fall in competitive fluctuation, straddling a deep, layered axis of polarities manifesting as seemingly irreconcilable dichotomies competing for control of the collective mind. These competing factions, both ancient and modern, include: the exoteric vs. the esoteric; science vs. religion; materialism vs. idealism; reductionism vs. holism; rationalism vs. empiricism; continuity vs. quantum; being vs. nothingness; the epistemic vs. the ontic; orthodoxy vs. the heretic; flux vs. stasis; the absolute vs. the relative; immanence vs. transcendence; causality vs. randomness; order vs. chaos; and determinism vs. free-will.

Violently clashing in reverberating fits throughout the distorting echo-chamber of history, beneath their rigid exteriors these polarized ideologies, methodologies, territorial alignments and paradigms secretly and unconsciously feed each other through the differences which oppose, inter-relate and unite them. On the surface, they seem wholly at odds, and yet deep within they remain locked in a tight symbiosis of interpenetrating

interfaces. And *through us*, these living monoliths grope and crash their way, ever onward, inward and upward, to a deeper, vaster, higher, more coherent, comprehensive and organic coalescence.

Slowly drifting and converging through the infinite "space of possibilities," the rigid and cracked empirical, logical and mathematical exteriors of the pragmatic, exoteric and quantitative systems move toward integration with the expanding soft and supple center of ancient esoteric wisdom—the common, unmoved, yet ever-yielding core of singular "metaphysical" understanding manifesting throughout all cultures of man and intrinsic to his deepest intuitions. This ubiquitous, esoteric wisdom is only divided and conquered—flattened into layers and layers trampled under foot with each successive generation—by the fossilization of differences in the superficial details of the rigid and arbitrary categories of man's symbol-systems. It is merely the institutionalization of the different arbitrary mappings—to the same living and breathing core—that stands between them.

"There has only ever been one ontological proposition…

…Being is univocal.

A single voice raises the clamour of being…"[i]

[i] — Gilles Deleuze, *Difference & Repetition*

CONTENTS (QUICK)

A NOTE TO THE READER 5
PRELUDE: SPELL-BINDING 7
CONTENTS (QUICK) 9
CONTENTS (FULL) 10
FORMATTING NOTES 20
INTRODUCTION: REAWAKENING THE EMBRYO OF RATIONALITY 23
PROLEGOMENA: NONDUAL RATIONALISM AND THE LABYRINTH OF THE CONTINUUM 57

PART ONE: THE BASIC FRAMEWORK OF INTERFACE PHILOSOPHY 104

THE INTERFACE BETWEEN INTERFACE PHILOSOPHY AND NONDUAL RATIONALISM 105
EMBRYOGENESIS OF THE CONCEPT (EOTC) 106
THE VISION-LOGIC COORDINATE SYSTEM (VCS) 123
THE UNIVOCITY FRAMEWORK (UF) 153

PART TWO: INTERFACE MATHEMATICS 200

MATHEMATICS: THE ART AND SCIENCE OF PURE RELATION 202
THE HOLARCHICAL UNFOLDING OF NUMBER AND OPERATION 307
AFTER-MATH: INTEGRATING THE DIFFERENTIATIONS FROM THE SECOND TIER 370
RECONNECTING THE LOST THREAD OF MATHEMATICAL RATIONALISM: SPINOZA, LEIBNIZ, IMMANENCE AND THE CALCULUS 400
TO INFINITY AND BEYOND: TUNING AND TRIUNING THE PARADOX 432

PART THREE: INTERFACE PHILOSOPHY AND NONDUAL RATIONAL-EMPIRICISM ... 484

PHILOSOPHY: THE INTEGRATING ART OF THE CONCEPT 485
SPINOZA'S ATTRIBUTE POLARITY AND "THE NUCLEATION OF OBSERVABILITY" 486
INTERFACE EPISTEMOLOGY: A PRELIMINARY SKETCH 542
LEIBNOZA VON SPINBITZ: AN IDENTITY OF OPPOSITES 660

TABLES AND LISTS 716

BIBLIOGRAPHY 719

INDEX 723

CONTENTS (FULL)

A NOTE TO THE READER 5
PRELUDE: SPELL-BINDING 7
CONTENTS (QUICK) 9
CONTENTS (FULL) 10
FORMATTING NOTES 20
INTRODUCTION: REAWAKENING THE EMBRYO OF RATIONALITY 23
Overview 28
Uncovering the Project of Esoteric Rationalism 33
Clearing Away the Dust of the Great Chain of Being 39
Post-Post-ism-ism: Condition-Critical in the Ontic-Shadow of Post-Kantian Dualism 42
The Gyth of the Miven 44
The Kantian Legacy: "Rationalism" vs. "Empiricism" 48
"Post-Metaphysics" and "Post Ontology": An Acategorical Stance 49
Aside: A Wilber Encounter of the Third Kind 53
Post-Metaphysics and the Transcendental Injunction 54
PROLEGOMENA: NONDUAL RATIONALISM AND THE LABYRINTH OF THE CONTINUUM 57
The Tao of Rationalism: Pulverizing the Categories 58
What is Nondualism? 58
What is Rationalism? 61
Nondual Rational-Empiricism and the Acategorical Imperative 64
The Nondual Rational as Trans-"Rational" 68
The Exoteric Face of Esoteric Rationalism 69
The "Labyrinth of the Continuum" and the Principle of Nondual Rationalism 73
Principle 1: Chord 1: The Fundamental Principle of Nondual Rationalism (PNDR) 86

Principle 2: The Un-Principle of Principles: 87
Infinite Division Equals Indivisibility 87
A Note on Descartes 90
Foundationalism, the Infinite Regress and the Transcendent-bias 92
Principle 3: Chord 2: The Principle of Immanence in Transcendence (Yin in Yang) 96
A Brief Note on Foundationalism: Logical and Ontological 96
Substance and Bundle Views of Substance 100

PART ONE: THE BASIC FRAMEWORK OF INTERFACE PHILOSOPHY 104

THE INTERFACE BETWEEN INTERFACE PHILOSOPHY AND NONDUAL RATIONALISM 105
EMBRYOGENESIS OF THE CONCEPT (EOTC) 106
Phase ONE: Unity 110
Phase TWO: Polarity and the Opposable Thumb of the Mind 112
Phase THREE: Triunity: Cultivating the Interface of Polarity 114
Principle 4: Chord 3: The Principle of Absolute Reversal (PAR) 117
Chord 3 Example: The Inverse Unified Field 117
Detecting the PAR 120
The Omni-Non: The Binary Logic of the Absolute/Relative Interface 120
Con-Fusions at the Interface 122
THE VISION-LOGIC COORDINATE SYSTEM (VCS) 123
Vision-logic Interfaces: Vision-logic and Blind-logic 124
The Plane of Immanence 130
The VCS: Breaking Away from the Plane of Immanence 132
The Two VL- Axes: Immanent/Transcendent and Transitive 135
The Transitive Axes: In Through the "Attic Window" 137
The Immanent/Transcendent Axis 138
Coordinates on the Immanent-Transcendent Axis 142
I/T Omni- and Uni-axes 145
I/T Interfaces, the Omni-Uni and the Omni-Non 146
A Concluding Note on the VCS: Integrating the Differentiations 151
THE UNIVOCITY FRAMEWORK (UF) 153
Univocity 154

Univocity: Introduction 154
Univocity: Monism, Polarity and the Nondual 156
Spinoza's Univocity 158
Univocity as Multiplicity 163
Univocity and Numerical Distinction/Identity 166
Univocity and Force 168
Univocity and Essence 170
Polarity and Univocity 174
Horizontal or Transitive Polarity 174
"Vertical" Polarity: The Polarity of Polarity 175
Univocity and the Fundamental Question 176
Univocity and the Vertical Ontic/Epistemic Polarity 176
Hegel's Dialectic vs. Univocity 178
Hegel's Dialectic as Performative Contradiction 180
Univocity as Deep Infinity: Prigogine and Leibniz 182
Univocity and Immanent Determinism 184
Principle 5: Chord 4: The Principle of Infinite Determinism (PID) 186
Symptomatology: Nomothetic vs. Idiographic Explanations 186
Univocity and the Eternal NOW 187
Exploring the Univocity Framework 190
The Axis of Univocity 194
The Univocity Framework In Action: Leibniz and the "Principle of Macrocosm and Microcosm" 195

PART TWO: INTERFACE MATHEMATICS 200

MATHEMATICS: THE ART AND SCIENCE OF PURE RELATION ... 202
Pre-rational Con-fusion and the Paradoxes of the Infinite 207
Implicit Holonic Set-Theory and the Part-Whole Axiom 207
The Galilean Part/Whole Paradox 213
Hilbert's Paradox of the Grand Hotel 216
A Note on "Operational" 220
The Polarity of the Finite and Infinite 222
The Finite, The Infinite, and Scope 222
The Identity vs. the Opposite: Post-Modern Con-fusion and Pre-modern Naiveté 222
A Foot in the Door to Paradise: Cantor's Quick Fix 229
The Cantorian Turn to Immanence: From the Uni- to Omni-Axis 231
A Final Cantorian Solution? 232
The Pearl Principle 236
Principle 6: The Pearl Principle of Axiomatic Encapsulation 238
Unity and Nonduality 240
Infinite Unity: ALL is ONE 241
Principle 7: Chord 5: The Quantitative Principle of Infinite Unity 246
Finite Unity: "Unity is Plural and at Minimum Two" 247

Principle 8: Chord 6: The Quantitative Principle of Finite Unity (or The Principle of Holonic Polarity) ... *249*
The Polarity of Infinity and (Primitive) Number ... 251
Trans-Trans-Bias: Pre-echo-echo ... 253
The (Binary) Cycle of Unity ... 255
The Orbit of Unity ... *261*
The Double Orbit ... *263*
Spinoza, the Infinite, the Indefinite and the Imagination ... 265
A Note on Fuller's Finite Absolutism ... *267*
The Triune Infinite: Interfacing Emptiness ... 269
Cantor's Three Infinities ... 269
Spinoza's Triune Infinite ... 271
Order 1: The Absolute Infinite ... *273*
Order 2: The Aspect Infinite ... *274*
First and Second Phases of the Aspect Infinite ... 275
Order 3: The Modal (or Bounded) Infinite: ... *280*
The Platonic Sphere as Root Modal Infinite and Primitive Infinite Number ... 282
The Fractal ... 283
The Triune Infinite and the Triad of Substance, Attributes and Modifications 286
VCS Meta-tags: Scope Parameters and Vision-logic Equations ... 289
The Vision-Logic Equations ... 291
The Root VLE (I/T Axis and the Absolute Infinite) ... *291*
The 2nd Order VLE (Aspect Infinite) ... *292*
The 3rd Order VLE (Bounded Infinite) ... *292*
Summary List of VLE ... *293*
Note: The Cycle of the Infinite ... *294*
Boundary and Dimension: ... 296
Dimension from the Omni-Non ... 296
Rectilinear vs. "Nuclear" Dimensioning Systems ... 297
Side-Note: Euclidean vs. Non-Euclidean Dimensions ... 306
THE HOLARCHICAL UNFOLDING OF NUMBER AND OPERATION 307
Phase ONE: The Immanent-transcendent Axis as Implicit Origin In Mathematics ... 308
Phase TWO: Unit-closure and the Finite Unit-Identity ... 309
Phase THREE: The Transitive-axis and Agglomeration ... 312
The Image of the Trans-Trans-Bias ... 313
Transitive Number as Agglomeration: The Natural Numbers ... 317
Addition and Closure on the Transitive-axis ... 319
Subtraction, Closure Violation and Transitive Zero as Negation ... 321
Transitive Zero: A Return to Origin ... 323
The Implicit Recursion of Numerical-Addition ... 324

Phase FOUR: Transitive Interfacing with the I/T Axis 325
Multiplication Through Division 325
Recursion, Iopol, Violation of Closure and the Acategorical Imperative 330
The Ratio and the Expanding/Contracting Holonic Solidus 332
The Rational and the Deleuzian Intensive Forces 335
The Absolute Value and the Intensive Forces 335
The Polarity of Zero: The Amphibian of the Transitive and Immanent 336
The Orthogonality of Inverses and the Offset Origin-Identities 339
The Kernel of the Trans-Trans Asymmetry and Instability at the Crossroads of the Transitive and I/T Axes 341
Phase FIVE: The Trans-Rational as Second Tier 343
I/T Powering and Rooting: Unfolding the Onion of Operations 343
Absolute Value and the Square-Root Property 349
The Imaginary as Vestigial Transitive Axis at the I/T Interface 349
The Implicit Axiom of Perpendicularity in Trans-Biased Pre-Rationality 350
Imagining the Unimaginable: Realizing the Unreal 351
Four-Dimensionality: Trans-Biased vs. Immanent/Transcendent 353
Structural vs. Representational Relation 359
The Trans-Rationality of the Irrational Numbers 366
AFTER-MATH: INTEGRATING THE DIFFERENTIATIONS FROM THE SECOND TIER 370
The Maps of Interface Mathematics 371
The Map of the Holarchy and VCS Axes of Mathematical Operations 371
The Core SpinbitZ Diagram 373
The Saw-tooth Curve of Iopol Inversion in the Evolution of Number and Operation 379
The Binary Cycle of Identities, Axes and Unities 381
Functions and Graphs From the Second Tier 386
Unpacking the Onion of Operations 386
The Cartesian Axes and the Image of the Trans-bias 387
The Implicit Iopol of Function Operations 390
Looking for Holes in the Rational Functions: Locating Asymptotes 390
The Immanent Function 392
The Balanced (Rational) Function 392
The Trans-Trans Function 393
The Transcendent Function 394
Embryology Through the Exponent and Logarithm 395
Unpacking the Onion: Expanding Logarithmic Functions 398
The Trans-Rational: Ontogeny Recapitulates Phylogeny 399
RECONNECTING THE LOST THREAD OF MATHEMATICAL RATIONALISM: SPINOZA, LEIBNIZ, IMMANENCE AND THE CALCULUS 400

Leibniz, Spinoza, the Triune Infinite and the Calculus 401
The Inception of the Calculus 401
The "Ghost of Departed Quantities" and the Problem with the Infinitesimal . 402
Fixing "The Limit" of the Unlimited 404
The Hidden Leibnizian Thread 405
The Spinozan Catalyst in the Triune Infinite 407
Leibnizian Pre-Echoes of Cantor 409
The Nondual-Rational Interface Solution 413
Reconnecting to the Deleuzian Alternative Lineage 416
Hegel's Calculus of Misrepresentation 416
Deleuze and the "Differential Point of View of the Infinitesimal Calculus" 422
TO INFINITY AND BEYOND: TUNING AND TRIUNING THE PARADOX 432
The Acategorical Perspective and the LOMA 433
Paradox and the LOMA: A Geometrical Example 435
Paradox as Transitive Illusion of Perspective 439
Galileo, Cantor and the Transfinite 442
The Two-Floors of the Transfinite 445
Summary: The Nondual/Interface Definition and Resolution of the Nature of Infinity 447
Back to Zeno 448
Swirling in the Presocratic Soup 449
From Muck Into Form 450
Parmenides and Second-Order Philosophy 451
Corso and Recorso: Self-Similarity in the History of Philosophy 452
Plurality is Unity: Zeno's Core Paradox 454
Post-Socratic Scope Con-Fusion 456
Parmenides, Heraclitus, and the Cycle of Unity and VL-Axes 459
Simultaneous Division "Through and Through" 461
Aside: Countable and Uncountable, Linear vs. Parallel and the "Hard Problem" of Consciousness 465
Zenonian Plurality and the Binary Interface of the VL-Axes 465
The Paradoxes of Motion and the Many Faces of Plurality 468
The Dichotomy: "Motion Cannot Take a Start" 470
The Achilles: "Motion Cannot Come to its End" 470
The Stadium: "The First Two Arguments Combined for Extended Bodies" .. 471
The Naked Paradox (The Arrow): "Motion is Self-Contradictory" 473
Tuning and Triuning the Naked Zenonian Interface 475
Further Cultivating the Zenonian Third 476
Paradoxical Postscript and Epitaph: Kan't and the Antinomies of Pure Reason 479

PART THREE: INTERFACE PHILOSOPHY AND NONDUAL RATIONAL-EMPIRICISM 484

PHILOSOPHY: THE INTEGRATING ART OF THE CONCEPT 485

SPINOZA'S ATTRIBUTE POLARITY AND "THE NUCLEATION OF OBSERVABILITY" 486

Section I: Bridging the Interpretive Rift 487

Orientation 487

Overview of the Problem of the Attributes 488

The Interpretive Rift: Subjectivism vs. Objectivism? 489

Section 2: The Crossroads of Hidden Polarities 494

Ontic/Epistemic Visa Versus Subject/Object 494

The Ontic/Epistemic Polarity 496

Clarifying Our Terminology: The Objective-Ontic Shift 496

The New Ontic/Epistemic Polarity 498

The Attributes as Both Formative and Descriptive Protocols 500

The Attribute Polarity: "Unity is Plural and at Minimum Two" 502

The Intersection of Polarities and the VCS 502

Cognitive Interfaces – The Nucleation of Observability 504

From Modes to Heaps and Holons 504

A Note on the Attributes 508

Attribute Parallelism: Connected Isolation and the Explanatory Gap 510

The Problem of the Attributes Revisited 512

"Transcendental Empiricism" and the "Cogito of the Dissolved Self" 513

Section 3: The Polarities in Action, and a Resolution of the "Hard Problem" 515

The Roles of Extension 515

Extension as Transitive Expansion 515

Extension as it Relates to Perception 516

Extension as it Relates to the Essence of Substance 520

The Mind-Body Problem and the Symbiogenesis of Subject and Object 525

The Mind-body Problem as a Limitation of the Fundamental Descriptive Protocols 525

Emergence, Mnemonic Primitives, and the Symbiogenesis of Subject and Object 529

Identity Theory, Neutral Monism and Nondual Rationalism 534

Concluding Note On Spinoza's Attribute Polarity 539

INTERFACE EPISTEMOLOGY: A PRELIMINARY SKETCH 542

Interfaces at the Crossroads 543

Condition Still Critical: Waking Up from the Post-Op Nightmare of the Kantian Radical Ontotomy 546

The Triune Epistemic: An Outline of the Interfaces 550
Ontic-Epistemic: The One vs. the Ten-Thousand Things 550
Crossing out the Cross-Talk: -ic Versus -ology 550
The Subject/Object and Ontic/Epistemic Interfaces 552
Reality, Meaning and Language: Aristotle's Three Levels of Being 556
Interfacing AQAL Metatheory and the Integral OS 558
From Dependent- to Tetra- Arising: The Conceptual Embryogenesis of AQAL 561
Identifying Quadrant Absolutisms 562
The AQAL Map and the Vision-Logic Coordinate System 564
"All is Perspective" Visa Versus "All is Holonic" 567
Holarchy as Anatomy: The Atom and the Network—the Holon and the Rhizome 571
Depth vs. Span: Further Untangling the Trans-Trans-Bias 574
The Problem of the Infinite Holarchy 579
Evolution is Involution Seen in Reverse 581
Aside: The Black Hole and Meditation 584
Trip-Reset: "Simplest Bodies" and the Self-Similar Kosmos 587
Holarchic and Holonic Depth: The Rhizome and the Tree 590
Embodiment, Knowledge and Meaning: the Rise of the Sensory-Mnemonic Interface 593
Defining the Scope of Scope 593
The "Truth of Relativity" Vs. the "Relativity of Truth" 596
The Cogito Interface: The Root of the Empiric and Epistemic 596
Sex Cells: "Deep Evolution" is Intelligent Design 598
Evolution and the Problem-Child 600
Shotgun Creationism: The Engineering Interface 601
The Interface of Intercourse 603
Sex and the Big Biological Bang 604
Insane in the Mem-brain: Embodiment, Meaning and the Mnemonic Primitives 606
Language Learns to Speak: Genetic Mnemonics and Causal Languages 606
Sex, Feedback and Evolutionary Sensation 607
Deep Evolution and the Intensive Forces 608
Interface Biology 609
The Evolution of Sensation 611
The Self-Aperture and the Sensor-Effector Polarity 614
The Emergence of Meaning in Deep Evolutionary Embodiment 617
Percept and Concept 618
The Symbiogenesis of the Rational and Empirical 619
The Symbiogenesis of the "Forms of Sensibility" and the Sensation of Form 620
The Embryogenesis of Theories of Perception 625
Phase One: Unity is Blind 625
Phase Two: Polarity and the Naïve Genius of Evolution 625
Phase Two…Minus-a-Half: Directly Indirectly Anti-Realistic 627
Phase One-Half-Minus-Two: Anti-Realism and the Contracted Cogito 628

Phase Three: The Interface Model of Perception 629
Trans-Folding Models of Knowledge and Truth 630
Knowledge Acquisition: Rationalism, Empiricism and Constructivism 630
Quadrant Interfaces and PAR-Tunnels: Cogitism, Formalism and Other Theories of Knowledge 632
The "Schmiderialism" Tunnel 632
Realism, Phenomenalism, and Pragmatism 634
Knowledge, Truth, Scope Con-Fusion, and the Infinite Regress 635
Infinitism and Affirmation 637
Naiveté, Dogma and Skepticism 637
Correspondence and Analogy 639
The Fold and "Ruin" of the Object 641
Foundationalism: Crystalline Pyramids In Emptiness 642
Transcendental Determinism and the Captive Will 644
Coherentism: Water-Tight Rafts Over the Abyss 647
Logic as Circuitry 647
Coherence Floats: Up the Creek Without a Paddle 648
Lost and Foundherentism 649
Gettier, Internalism and Externalism 651
The Gettier Problem and the True Relations of Knowledge 651
Internalism: Bounded in Nut-Shell 652
Externalism: Opening the Interface 653
Internal or External to What? 653
The Interface Model of Epistemology: A Concluding Sketch 654
Integrating the Differentiations 655
Interface Epistemology: A Glossary of Terms 657
LEIBNOZA VON SPINBITZ: AN IDENTITY OF OPPOSITES 660
Recap on the VLE 662
The Root VLE (I/T Axis and the Absolute Infinite) 663
The 2nd Order VLE (Aspect Infinite) 663
The 3rd Order VLE (Bounded Infinite) 663
Spinoza: A Nondual Sketch 665
Polarity: Substance and Modification—Emptiness and Form 665
Triunity: Substance, Modification and the Attributes 666
Spinoza: Immanent in Transcendent, and Visa Versa 667
Leibniz: A Reactionary Chiaroscuro 669
The Culmination of the Proto-Rational 670
The Spinozan Heresy 672
The Principle of Action, and the Inner-Spinoza 673
The Elements of a Reaction of "Pure Transcendence" 677
God is Not Nature 677
Spinoza's God is Not God 677
The Possible is Not Actual 678
The Prime Chooser 679
Impermanence: Man is Not Mortal 681

The Monadology: Substance is Not Infinite *682*
The Action of Reaction 683
Monads and Indra's Magic Hall of Mirrors *683*
Monadic Immaculate Conception and the "Problem of Sex" *684*
"Metaphysico-Theologo-Cosmolonigology," and the Best of Non-Possible Worlds *685*
The Universe's New Clothes 687
Compossibly Impossible 688
God, the No-Brainer: Metaphysical vs. Moral Necessity 688
Transcending into Transitivity 690
Principle 9: Chord 7: The Principle of Pure Transcendence as Transitivity *692*
Principle 10: Chord 8: The Principle of Infinite Possibility (or the Principle of the Proton Pseudos) *693*
Transcending Freedom into Fatalism *693*
Immortality…as a "Speck of Dust"? *695*
Driven Into Infinite Improbability *697*
The Leibnizian Dilemma: Spinozism or Atheism *698*
God is *not* a Monad: Leibniz is a Spinozist 699
God *is* a Monad: Leibniz is an Atheist 700
The Imminent Collapse *701*
Magnum Disharmonium 701
Presumptive Salvation 701
The Two Travelers *702*
The Mannerist Aesthetics 703
Animality, the Fold, and the Infinite Baroque Machine *707*
Leibniz: Immanent Versus Transcendent God, with No Visa! 709
The "New Harmony" *711*
Acknowledgements 715

TABLES AND LISTS 716

List of Illustrations *716*
List of Equations (VLE) *718*
List of Principles *718*

BIBLIOGRAPHY 719

INDEX 723

FORMATTING NOTES

Footnotes

In order to help the reader remain undistracted by the many notes and references, and to increase the reader's own control of the flow of such a complicated experience, I have differentiated the notes into three types (naturally), with their own simple hierarchical order of operations (see below), and placed them at the foot for easy access. The reader will very quickly become accustomed to the symbology and easily and unconsciously become aware of which notes to entirely ignore and which to possibly explore, according to his purposes.

1. **Subject-Tangent (i):** This is the default; just a regular note, a tangent of thought, or a curiosity leading perhaps nowhere in particular… It will have no specific symbol other than the roman numeral they all share in common, such as.[i]
2. **Subject-Link (*):** This note signifies a subject reference, or a hyperlink (for the ebook) for splitting off into a related but different subject trajectory in the book. This note will be followed by an asterisk, as such,[ii*] and the note itself will contain only a reference or hyperlink to a different section of the book, along with perhaps a bibliographic reference.
3. **Bibliographic Note (¥):** This is simply a bibliographic reference, for those tracing back to original sources. It will be followed by a ¥, as such.[iii¥] Page numbers, where available, will be included with the "quote," such as (p66).

[i] e.g. Bucky Fuller mentions that Roman numerals were generated from the common numbering system of notches or slashes, where larger bundles of slashes, say of five, are marked with a slash through them so as to be counted by fives. This new symbol of the slash then evolved, for example, into the symbol 'V'.

[ii*] e.g. See this page.

[iii¥] e.g. (Ouspensky) p. 56

Order of Footnote Operations: These types are arranged in order of importance to the reader in controlling the nonlinear flow of his/her experience. As such, the bibliographic note takes lowest priority, and the quick subject-tangent the highest. Where any of these are combined, they will be subsumed under their next higher order. For example, in any instance of combination with a subject-tangent, the note will be subsumed under this default subject-tangent referent, e.g. [i]. If the reader has further interest in the subject-tangent, for example, he may also find a subject-link and/or bibliographic note. But where the subject-link and bibliographic note are combined, the referent of the subject-link (*) will be used. And only where the bibliographic note stands on its own, will we find its referent, ¥.

Index and Definitions

Given the volume of new terms in this work, the index will contain references to key places in the text where these new terms are defined. This will be noted simply with the sub-term "definition of."

INTRODUCTION: REAWAKENING THE EMBRYO OF RATIONALITY

> *Philosophy is the art of forming, inventing, and fabricating concepts.* — Gilles Deleuze and Felix Guattari

> *Understanding through the eyes has been put to sleep and must be reawakened…* — Rudolph Arnheim

SpinbitZ is a toy: a playful, whirling, churning, folding and unfolding set of concepts and visual interfaces, created, and to be used, ultimately for enjoyment. It is not to be taken absolutely, as an attempt to unveil THE TRUTH about ultimate reality. This conceptual toy emerged slowly, but spontaneously, as the most creative, difficult, artistic, rigorous and enjoyable endeavor that I have undertaken.

"Joy emerges as the sole motive for philosophizing," says Deleuze. While this is necessarily a personal motive for philosophy, there are certainly transpersonal and evolutionary layers of motivation as well. All animals play, and this play serves the critical function of flexing, strengthening, and even creating, mental muscles, skills, perspectives, patterns and intuitions for use in other spheres. The Rubik's cube, recall, was played for hours, days, and months on end by the most serious of scientists and mathematicians.

Indeed, while SpinbitZ can be seen as a sort of puzzle for the ever-curious, unlike the Rubik's cube, it is a puzzle that while figuring it out—while playing with the toy—a valuable meta-perspective and conceptual *toolset* will begin to emerge into the curious and open mind of the reader. It then becomes a visual *interface* for playfully understanding, integrating, cross-fertilizing, and inter-harmonizing many aspects of human creative endeavor; from art, to science, to philosophy, and to mathematics.

This is the value and function of this philosophy; to integrate the fragmented forms of knowledge through a perceptual (empirically engendered) "vision-logic" interface; a meta-paradigm or meta-system *space* in which to see things anew and from a critical and integrative distance. In the process of integration, the new forms have a new conceptual field in which to play; a new playground. Thought systems, once constrained to an older interpretation, a fossilized and outmoded territory, become "deterritorialized" in a new context, and thus liberated to be expanded within and upon—their project and purpose, perhaps, more fully realized.

This is indeed the deeper creative and evolutionary function of philosophy, because—as Buckminster Fuller would argue—in a world of increasing specialization, if no-one specializes in *comprehensive generalization*, then who is looking at the big picture? In that case we are indeed "divided and conquered" by our own educational system; a royal road which forces individual specialization into one narrow field of study in order to "have a career" and "make a living," but at the expense of integration and mutual understanding between other specialists. To be sure, visionaries like Fuller often have to step entirely outside "the career," and outside the educational system itself[i] to do just that, on behalf of humanity; to take a step back and get a good look at where we are at, *as the whole of human-kind*, and where we are heading. And most importantly, this function of philosophy serves the purpose of evaluating where we could go if we could take stock of our options and allow our collective creativity to emerge.

That, as well, is the function of meta-paradigm and meta-system explorations such as SpinbitZ. To create and expand a system in which we can take a step back and begin to scientifically or rigorously compare, contrast, integrate, cross-fertilize and cross-catalyze more specialized systems themselves (such as science, philosophy and mathematics and their subsets), and ultimately to transcend-and-include the useful parts and let the not-so-useful parts fade away . . . or come to rest in the unfolding archive of humanity to be made use of later.

SpinbitZ emerged naturally from my method (as primarily an artist) to playfully understand and integrate whole fields of concepts in the most comprehensive, organic and integrated way possible.

I have always been averse to doing homework—for example in mathematics—and as a child I would rather spend my class-time doodling on the text-book or the desk. The artist in me recoiled from the tedious job of the calculator.[ii] I have also had a problem with accepting and memorizing

[i] Fuller was *twice* expelled from Harvard

[ii] …though, at one point, it embraced and took over the difficult job of the camera, so it's not merely the rigor that it recoiled against, but rather the level of generality, perhaps.

the mathematical principles that seemed so unexplainable, unvisualizable, arbitrary and even contradictory. I always want to ask WHY? And to *see* in my mind's-eye what is happening to lead to such a rule or habit.

Toward these ends and driven by these unconscious goals and propensities for pleasure and vision in understanding, this meta-mathematical system (Interface Mathematics) emerged; unfolding slowly, yet spontaneously and intuitively. Rather than doing much of the homework in my college algebra classes—which was designed to drill in the seemingly arbitrary rule-systems and abstract concepts that otherwise have no conceptual grounding—I would instead tease out the details of this new system as they emerged from interfacing the new rules with the embryonic meta-mathematical form already breathing itself to life in my mind.

Surprisingly, as I became more and more capable of visualizing, or internally *sensing* the interactions and relations within the emerging organism of this system, the whole of fundamental mathematics, with its abstract and seemingly arbitrary principles, began to make intuitive and visceral *sense*. It began to speak to me; no longer in riddles, but in *pictures* and *clear, sensible structures* that mirrored my view of the kosmos[i] itself—holarchical, boundless, endlessly unfolding. [ii] Mathematics no longer seemed abstract and arbitrary, like random bits of code needing strings of meaningless mnemonics to tie them down to a rigid and brittle chunk of habitual finger-memory.

Ultimately, as it developed, I had to do less and less of the rote memorization in the homework in order to pass my tests. And new ideas presented in the class just seemed to illuminate, resonate and reinforce hidden places already present in the system. The algebra class began to get very exciting as I would continue to tease out how the mathematics naturally unfolded in the vision.[iii]

The experience of interfacing this conceptual system with mathematics is a particularly clear and vivid example, but the same basic function and experience occurred over a longer time-frame with my much earlier and

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[i] Kosmos is the ancient Greek term not merely for the physical or objective universe (the cosmos) but for ALL of reality, putting the subjective, and other spheres, on equal (neutral, nondual) footing.

[ii] Holarchical means; wholes made of deeper parts, which are wholes made of deeper parts, which are wholes made of deeper parts, and so on…

[iii] In retrospect, I suppose it would have had the same "intellectual mustiness" which Fuller spoke of when discovering some of his many generalized principles, laying dormant for an eternity to be uncovered…if it hadn't been overwhelmed by the feelings of sneaking into the graveyard of respectable philosophy and digging the jewels off the dead fingers of my heroes, Spinoza and Leibniz, and trying to get the crypt-keepers to trade it in for gold; rather than being content to stare at the mausoleum frontispieces. No, this has an earthier feel, and the jewels have unexpectedly turned to seed…readied to teraform the largely forbidden and deserted planet of esoteric rationality.

more detailed studies in science and philosophy. Indeed, the largely unconscious embryogenesis of the meta-system itself unfolded in these earlier studies. As in my experience with mathematics, as the interface evolved I gradually began to make sense of the fields of study, as the paradoxes, irreconcilable dichotomies and antinomies, that seemed to be taken for granted by my professors, for me began to melt, often spontaneously away.

The surprise and exhilaration felt in this application to mathematics is perhaps a result of having interfaced with a deeper property of the formation of concepts in general—what I call the "embryogenesis of the concept"[i]*—manifesting in the intensely creative fields I was studying, namely science, philosophy and later mathematics.

The Mathematical model, therefore, naturally mirrors—in a simpler and distilled form—the emergent ontological and epistemological model outlined in this work, as well as the physical model to be outlined in *SpinbitZ, Volume II*. This convergence and self-similar embryogenesis between these fields of concepts allows the explorer to use the very same core concepts and tools for each field or facet of understanding. It allows one to build a coherent and integrated whole, the benefits of which are impossible to describe at this level of generality. They must be felt when the whole system can finally be seen in the mind. When you find the "plane of consistency"[ii] in this model—when it begins to make *sense* as a whole—then the effects and uses will become intuitive and apparent.

But all of this was only made possible from a training in the visual arts. As Rudolph Arnheim says in his book, *Visual Thinking,* "the arts are the most powerful means of strengthening the perceptual component without which productive thinking is impossible in any field of endeavor" (p3). Having started my life as a visual artist, I gradually discovered that my artistic expressions were becoming more and more philosophical as time progressed. I would often notice that in the back of my mind, as I lay thinking, an unconscious and intricate visual form was taking shape in my visual field; line by line, curving and collecting into shape after shape, unconsciously informing and solidifying the conceptual construction. Finally the philosophy began to rise above, transcending-and-including this ever-present and often unconscious visual art-form.

The same sort of process must have occurred, in some form, with M.C. Escher, when he wrote in an essay entitled *Approaches to Infinity*:

> However, it may happen that someday someone will feel a specific and conscious longing ripening within him to approach infinity as purely and

[i]* See the section Embryogenesis of the Concept (EOTC), p106.

[ii] As Deleuze calls it.

> as closely as possible by means of his representations. This may happen to someone who has not absorbed much factual knowledge—someone who has not done much studying of previous generations, someone who, as plastic artists do, fills his days with the designing of more or less fantastic images.

The art remains a key factor in the expression. It is an integral part of a symbiosis; an interface which informs and empowers the logic of the philosophical vision. And often it is through explicit catalysis in the creation of visual diagrams—vision-logic interfaces—that the philosophy itself necessarily unfolds. The linear expression of verbal ideas gains a new perspective through the non-linear and highly parallel expression in a visual form. They feed into and rebound off each other. With visualization, the whole mass of concepts can finally be seen simultaneously, nonlinearly, as one vibrant whole, instead of spaghettified by the linearity of language — l-e-t-t-e-r b-y l-e-t-t-e-r, word … by … word … sentence by sentence.

The diagrams used in this construction are therefore found throughout this work as they will help the reader to process the abstract linear verbiage through the deeper, nonlinear and vastly parallel sensory functions that all humans possess. It is ultimately through the *senses*, transcended-and-included in higher, more abstract, cognition, that the *sense* of the text is truly, *integrally*, embodied.

This is the general goal of SpinbitZ; to make *sense* of abstract thought through the employment of the human interface of *sensation*; to empower the conceptual imagination through images. Philosophy as the integrating art of the concept; a philosophy of vision-logic interfaces—and hence an Interface Philosophy.

OVERVIEW

Interface Philosophy is a study of concepts through the use of percepts—or more precisely, a study of the conceptual roots, relations and patterns of concepts where they merge with percepts into vision-logic interfaces. This then, is an exploration of the perceptual *embryogenesis* of the concept, and thus an examination of the empirical roots of Rationality itself.

In digging into the perceptual core of conceptual relation, the concepts of boundary and polarity will be seen as fundamental, just as they are fundamental to perception. Indeed it would seem that nothing can be conceived or perceived without boundary. A conceptual distinction itself is a boundary. Polarity, as well, is key to both percept and concept, and all senses are based on the polarity of contrast. And indeed, polarity will be seen as the opposable thumb of the conceptual mind—fundamentally indispensable as the most primitive and powerful form of conceptual relation. Certainly as well, polarity lies at the very heart of a conceptual understanding of nonduality.

But, polarity and boundary have a curious relationship, because boundary can be seen as the intervening *third*, or "triune interface" between the two poles of a polarity; such as the boundary between the within and without, or between black and white. And inversely, polarity can be seen as the *integration* between the two halves of a boundary, such as in the Taoist concept of the identity of opposites, as in Yin and Yang.

Applying these simple fundamental concepts and tools together, the polarity of the bounded and the boundless, the finite and infinite, will take center stage, providing a triune interface and meta-view on the concept in general; a "univocity framework." This is therefore largely a work about interfacing infinity—bounding the boundless and unbinding the bounded. It is also about "pulverizing" and rebuilding the categories surrounding the infinite. Indeed, the infinite will no longer be seen as a "disastrous regress," but as a boundless source of emergence; a fullness to Emptiness, and a "positive infinity," what Deleuze calls "the secret of Grand Rationalism." And hence in order to truly transcend-and-include the rational into the "trans-rational," one must first interface rationally and conceptually—and indeed perceptually and thus empirically—with the nature of the infinite. One thus moves beyond the common confusions and paradoxes of the infinite, by transcending the common pre-rational set of concepts which generate them.

In also tracing a nondual thread of Rationality to its historical roots, we will discover that only the dualistic, exoteric (or commonly understood) forms of rationality begin with the Greek trinity: Socrates, Plato and Aristotle. By reconnecting to the earlier nondual truths of Heraclitus and Parmenides, we find the conceptual *axis-mundi* itself (what Lao Tzu called "the door to all wonders") spinning at the hidden core of Zeno's paradox, and thus at the core of nondual Rationality. Through a fusion of Art, Science, Mathematics and Philosophy—and with the help of nearly a hundred vision-logic interfaces—we'll trace this *embryogenesis of the concept* of Rationality, as it reconnects to the alternative historical lineage of rationality uncovered by Deleuze, with a nondual fusion of the systems of Spinoza and Leibniz.

In esoteric Theosophy it is said that in the "shock" of the interface between Spinoza and Leibniz "the essence and Spirit of esoteric philosophy would be made to appear." Unfolding through these vision-logic interfaces, the "cultivating thirds" of this Interface Philosophy finally appear to reconcile many of the dualities plaguing the history of exoteric Rationality. In its nondual interface with empiricism and Integral theory, for example, a detailed sketch of an Interface Epistemology is unfolded. Operating at the crossroads of the ontic-epistemic (reality vs. knowledge) and subject-object polarities, the evolutionary symbiogenesis of the exoteric dichotomies at the foundations of human knowledge is examined, illuminating and reconciling the "ontic-shadow" of post-modernity.

The process of reanimating these hidden nondual truths demonstrates that mathematics itself mirrors this holarchic embryogenesis and structure. Unfolding in layer upon layer, this Interface Mathematics transitions from the "oppositional forces" of dualism, ultimately again to the "intensive" and integral truths, and originary axis-mundi of the nondual. In making mathematics visible, visceral and understandable—a Vision-Logic Coordinate System is constructed revealing two fundamental axes of conceptual thought (one of which is this axis mundi). Spinoza's "three infinities" are then shown as the triune interface, or cultivating third between these binary axes, for illuminating and reconciling the many paradoxes of infinity—e.g. Zeno's and Galileo's—as they wind their way into the truths of our modern mathematics of the continuum and set-theory.

But there is no pretense that these concepts reveal an *absolute* Truth, or a Platonic ideal form underlying reality itself. Nor is there any notion that the concepts are complete and all-encompassing in themselves…or even entirely correct. These are ultimately just foundation-level patterns of concepts which help make sense of higher-level patterns and systems of concepts, such as mathematics and philosophy. Interface Philosophy is thus the interfacing of concepts with concepts, and ultimately through percepts—and thus it is the interface between rational and empirical methodologies for the

purpose of converging upon higher level systems of order and integration within concepts themselves. Through this, however, it is hoped that the systems of concepts will come closer and closer to their most natural and integrated form, and thus closer and closer, perhaps, to Truth.

Interface Philosophy is a set of conceptual tools which I spontaneously evolved for myself, in my own interfacing with concepts, systems and the world around me. It is simply an expressive and receptive conceptual outgrowth which I have found essential in my contemplation of such abstract and often difficult ideas as the paradoxes of infinity, number, freedom, causation, mind, body, thought and matter—all of which will be explored in depth herein.

In Interface Philosophy, the interface is key. It is used in many different ways, as we have already begun to see. For example, on the very surface, the polar capitalization in the title SpinbitZ stands for the interface between the philosophies of Spinoza and Leibnitz (more commonly called Leibniz). The conceptual polarity found between their systems is embodied in SpinbitZ, with its beginning at the curvilinear S and its ending at the rigid pointy Z. We will start SpinbitZ with an emphasis on Spinoza, who focused on continuity, unity and the serene—as seen in the S and felt in the very sound of the word *Substance.*[i] And we will end with an emphasis on Leibniz, who focused on the individual, the multiple and the discrete aspects of the *monad.* But in Leibniz we find a profound tension between the *one* and the ONE, or between the monad and the Leibnizian transcendent God. And naturally this deep tension, contrast or "chiaroscuro" as Deleuze termed it, is seen and felt in the Z, and in the ending sound of *līb'nĭts.*[ii¥] And so this is our simple mnemonic through which to focus on the general distinction and polarity between these two philosophies. It is ultimately a polarity between the continuous and the discrete—the ONE, and the ALL of infinitely many ones—and thus a polarity between unity and multiplicity.

In the end we will effect an integration of the key aspects of Leibniz's and Spinoza's respective systems. We will ultimately find that when the mythic elements are removed, contrary to received opinion Leibniz's philosophy converges on essentially the same underlying nondual and univocal structure of rationality that we will initially explore through Spinoza. Spinoza, like Parmenides before him, focused on indivisible continuity and the ONE, whereas Leibniz, like Heraclitus or Anaxagoras, emphasized and exalted the infinitely divisible and the ALL. Ultimately, however, these are merely the two poles of the ONE-ALL, enfolding and unfolding in a truly

[i] When referring to Spinoza's "substance" herein, we will capitalize it to make the distinction to the common philosophical term and to distance ourselves from its foundationalist baggage.

[ii¥] http://www.answers.com/Gottfried%20Leibniz

nondual Rationality. This, as we will see, brings us far closer to a trans-rational empiricism than to our old, second-hand notions of Rationalism.

With the symbiogenesis and interface between percept and concept at the heart of an Interface Philosophy, we will indeed discover a symbiogenesis between Rationalism and Empiricism. So, despite our focus on the so-called rationalists themselves, the trajectory produced in this work, as a whole, can be called a Nondual Rational-Empiricism, or equally a Nondual Empirical Rationalism. As it stands, the emphasis on Empiricism won't be reached until near the end of this work, in the section on Interface Epistemology, where we will explore at great length the empirical roots of rationalism, and the rational roots of empiricism, in a tight symbiogenesis of percept and concept, and of subject and object. Indeed, this empirical emphasis is to be expected of a philosophy rooted in percept—and it is found to be subtly lining the exposition throughout.

SpinbitZ evolved largely through a fusion of the systems of Spinoza and Leibniz, but also through catalysis with Gilles Deleuze, Ken Wilber, Buckminster Fuller, Gerald Lebau, and others. And Nondual Rationalism and Interface Philosophy unfold in SpinbitZ together, indeed symbiogenetically. But there is a critical distinction to be made. The practical application of a trans-rational and vision-logic level Interface Philosophy, is what allows the underlying synthesis in Nondual Rationalism to emerge. And indeed we will find that only when rationality is embodied nondually is it truly and fully rational. In the end, the truths of the rational and the nondual are entirely complimentary, each supporting and evolving the other.

A truly trans-rational philosophy necessitates a fully developed rationality, not just in the rational methods of exposition and discourse, but in the synthesis between the core elements of rationalist meta-mathematics—such as the Leibnizian view of the calculus and Spinoza's Triune Infinite—as well as the esoteric understanding of the rationalist ontologies and epistemologies. Therefore the concept of the rational used herein will include and integrate the truths from both mathematics and philosophy.

These critical, embryonic and ultimately nondual ideas of the rationalists were lost in the flow of history. And those ideas that remained were flattened and distorted into an irrational chain of myths; forced into a single over-arching category, conveniently pushing the entire pre-Kantian era into an ill-fitting boundary outside the body of sanctioned philosophy. This represents at a socio-cultural level what psychologists call a "shadow element," a distorted aspect of the self broken off in the process of psychological (and in this case, psycho-social) development.

The main goal and program herein, therefore, is to reconnect to this lost thread of philosophical and mathematical rationalism, with its unrecognized

trans-rational roots and resonances in both Western empiricism and the nondual philosophies of the East, such as Taoism and Madhyamaka (middle-path) Buddhism. This critical project was aborted through the modern and post-modern historical misinterpretations (and in many cases, just plain ignorance) of the key embryonic insights and conceptual tools developed mainly by Spinoza and expanded through Leibniz (among others). These misinterpretations, incorporated wholesale into modern academia, were fostered by the reactionary anti-modern and anti-rational movements such as the "infinite representation"[i] and negative dialectic of Hegelian "absolute idealism" and the absolutized relativism of deconstructive postmodernism.

As it turns out, from this Deleuzian alternative place in history, the second-hand academic version of Rationality, inherited by so many brilliant thinkers, seems withered and misshapen by comparison. From this Deleuzian plane of consistency the esoteric project of Rationalism becomes vibrant and healthy; ready to explode in long forsaken directions, into a completely new toolset of concepts and perspectives.

[i] As Deleuze calls it, and as we will explore later.

> *It may be correctly stated that were Leibnitz' and Spinoza's systems reconciled, the essence and Spirit of esoteric philosophy would be made to appear. From the shock of the two—as opposed to the Cartesian system—emerge the truths of the Archaic doctrine.*
> — Madame Blavatsky, *The Secret Doctrine*, I, 628-29

This project emerged into consciousness as a spiraling visual interpretive fusion of the systems of Spinoza and Leibniz. The systematic fusion began to occur even before I learned of the recognition in esoteric philosophy of the possibilities of this fusion for the emergence of "the truths of the archaic doctrine." This process was catalyzed through contact with many different sources in science, art and philosophy, but most distinctly the work of R. Buckminster Fuller (Bucky) and his absolutely beautiful *Synergetic Geometry*,[i]* and Gerald I. Lebau with his work on a qualitative and causal understanding of fundamental physics.[ii]

During my exploration and creation process I stumbled upon the work of others, such as Gilles Deleuze and Ken Wilber, whose conceptual schemes were deeply resonant, and in some places virtually identical to my own—beneath the arbitrary and ultimately minor differences in word choices and category lines. I have since gone back and infused their additional insights into my own, allowing for further (if always unfinished) creative synthesis and resonance, ever fueling this soft, organic explosion.

Having started my exploration of philosophy, mathematics and rationalism in the West, there is naturally a focus on western thinkers, as this is my home. But the more I explore of the East, the more I recognize that I have started, certainly not at "the beginning," and perhaps not even with the most sophisticated forms of early rationality, math and science. I have come in

[i]* See Part Two: Interface Philosophy (p200), and Spinoza's Attribute Polarity and the Nucleation of Observability (p486) in this volume.

[ii] Sorce Theory is a new theory of matter and energy based on an explicitly causal and unified metaphysics matching in its general form the holarchical terrain explored (through its catalytic help) in this book. See www.anpheon.org and the section *Sorce Theory: Unlocking the Basement* in SpinbitZ: Volume II.

through the "attic window," just as Western mathematics itself, as Buckminster Fuller recognized, came in through the attic window of mathematics with its beginnings in rectilinear, as opposed to radial (or holonic), coordinate systems.

The earlier knowledge systems of the East seem every bit as detailed and profound as their early counterparts in the West, and indeed the same basic schools of thought seem to have emerged on both sides—beneath, yet again, the arbitrary and minor differences in words and category lines.

Relatively speaking, I have just begun my exploration of the exquisite knowledge of the East, and so only the most salient and well-known of these concepts will make it into this current work, as they naturally seem to resonate with the ideas of the philosophers of the West. These include the general concept of nonduality, Nagarjuna's notion of "Emptiness," the Buddha's "dependent arising," and what I am calling the absolute and relative "scopes," found in the "Two Truths Doctrine" of Buddhism. All of these concepts are crucial, I have discovered, for expanding the project of rationalism into the "post-post-modern" era.

As I continued to explore the project of Rationalism, I began to discover that the interpretations I was spontaneously generating in my readings of Spinoza, for example, were very different from the inherited formalisms that my professors were giving me (many of whom never studied Spinoza's *actual* writings). I seemed to naturally converge on a much more coherent and consistent (and ultimately nondual) interpretation of Spinoza in my readings, while my professors interpretations seemed clouded and disrupted by arguments that only served to distort and fracture the coherence of Spinoza's intended meanings, so as to count the project of Rationality as a whole, a failure.

After writing my first formal paper on Spinoza, *Spinoza's Attribute Polarity*, and in preparation for my next one, *Spinoza and Leibniz: An Identity of opposites*, (the ideas of both are included in this volume), I discovered the luminous and obscure work of Gilles Deleuze, and that I am not at all alone in my unorthodox Spinozism. At about the same time, I discovered the vast and beautiful net cast by Ken Wilber in his Integral philosophy. It seemed that while Wilber's philosophy was entirely resonant with the alternative Spinoza that Deleuze and I had converged upon, Wilber's actual views on Spinoza were a repetition of the academic party line that I encountered in my university courses. Wilber was espousing what Deleuze and I would consider an essentially Spinozistic "univocal" philosophy,[i] but he was, and is,

[i] …minus the inherited Leibnizian-Kantian-Hegelian shadow-element from academia, as well as the explicit grounding in the nondual framework of Univocity, which we will explore in much greater depth later on.

quite unaware of its resonances in the esoteric and emerging understanding of Spinoza.[i]

But Deleuze's interpretation of Spinoza is certainly not without its critics, and controversies. For example, Pierre Macherey, one of the most acclaimed of contemporary Spinoza scholars in France, is highly critical of Deleuze on this point. According to Simon Duffy (in his "The Logic of Expression in Deleuze's *Expressionism in Philosophy: Spinoza*: A Strategy of Engagement") Macherey asks whether or not Deleuze's interpretation "is consistent with the original sense of the work he purports to analyse, or does it rather misrepresent Spinoza's philosophy?"[ii¥]

Duffy says:

> In order to respond to this kind of questioning it is necessary to be clear about the conception of the history of philosophy that is being brought to bear on both the text of the Ethics and on Deleuze's reading of the *Ethics* in *Expressionism in Philosophy*. If a study in the history of philosophy solely strives 'after a faithful, correct reading, attempting merely a risk-free identical reproduction or charting of what is written in the *Ethics* as though it belonged to a realm of past thoughts',[iii¥] and as though Spinoza's thought 'could be captured once and for all, grasped definitively in the ideological context in which he lived and died',[iv¥] then the presupposition that there is an original sense of a work accessible only to the erudite historian of philosophy would be acceptable as unproblematic, and any problematization of this presupposition would thereby be determinable as a misrepresentation of the 'original sense of the work'.

In other words, in order to get a fresh look at the text in question, we must "deterritorialize" it, as Deleuze might say, from past interpretations that have become fossilized and might channel our own interpretation into a mere repeating of past hermeneutic dead-ends or errors. Otherwise, it is those past *interpretations*—which, especially in the post-Kantian era, cannot be held as absolute and pre-given—that would serve as the sole criterion for success in any further interpretation.

In Wilber-speak, we must jump out of the "kosmic groove"—or better yet, the "kosmic rut"—of academic/exoteric Spinozism, if we want a fresh look at Spinoza in the context of our modern era. This is precisely what

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[i] I have had several discussions with Wilber on this issue, and he continues to state that Spinoza is a "dedicated Cartesian." When challenged on this issue, however, he did not attempt to back up his claim, so the appearance is that he got it from a second-hand source, without the context.

[ii¥] Pierre Macherey, 'The Encounter with Spinoza', trans. Martin Joughin, in Martin Patton (ed.) *Deleuze: A Critical Reader* (Oxford: Blackwell, 1996), p.142. This is one of the questions central to Macherey's problematization of Deleuze's reading of Spinoza in the 'The Encounter with Spinoza'.

[iii¥] Ibid., p. 148.

[iv¥] Warren Montag and Ted Stolze (trans. and eds), *The New Spinoza* (Minneapolis: University of Minnesota Press, 1997), p. x.

Deleuze and many other thinkers have done, and even more now are continuing to do. And this ever-renewed examination is critical, if indeed Spinoza's message was ahead of the *times* into which it was initially injected—an era which cast its interpretive, enlightening and ultimately obscuring forms upon it in the "History of Philosophy." If Spinoza's message is for the future, then the future—perhaps indeed our "now"—must be freed of the interpretations of the past in order to understand Spinoza's message.

Duffy writes:

> According to this conception of the history of philosophy, one way to understand the 'importance' or 'influence' of the different figures in the history of philosophy on contemporary thought would be to determine 'the citations, the references, and the borrowings (acknowledged and unacknowledged) that bind contemporary thought to the texts of' these figures, which would thus put each of them 'in the position of a predecessor or forebear whose thought "anticipated" the concerns' of contemporary thought.

Many thinkers have done just this with respect to Spinoza, exhuming the influences of Spinoza's thought in various contexts in the sciences, in history, the humanities, and in philosophy, to name a few. For example, Matthew Stewart, in *The Courtier and the Heretic*, examines Spinoza and Leibniz in a very fresh and unbiased light, demonstrating that Spinoza's philosophy was directly influential to the empirical philosophy of John Locke, and that Spinoza is not the "rationalist" that is generally claimed of him. Stewart deftly shows that Spinoza is very much a forebear to radical empiricism, such as that espoused by David Hume (we will explore this connection in greater depth later on). Indeed, Deleuze himself sees Hume as a critical link, and kindred spirit, in his alternative chain of history, with Hume following in the path (if unconsciously through the work of Leibniz and Locke) laid out by Spinoza.[i]

Duffy continues with an exploration of the modes of historical analysis:

> 'Another way'… 'would be to situate the contemporary "reception" of Spinoza in the history of Spinoza studies, as the most recent in a series of "readings" of Spinoza from the atheistic Spinoza of the seventeenth century to the pantheist Spinoza of the eighteenth and early nineteenth centuries to the monist of the twentieth century'.

[i] Another thinker demonstrating the influences and resonances from Spinoza's work is the modern neuroscientist, Antonio Damasio, whose book, *Looking for Spinoza: Joy, Sorrow, and the Feeling Brain*, demonstrates that Spinoza's philosophy can serve as a general basis for contemporary explorations into the neurobiology of the emotions.

And so we can see that the interpretation of Spinoza has changed radically through the years, depending on the historical context in which it is addressed. It is therefore anything but pre-given and static.

Indeed, in the last few decades there has been an explosion in Spinoza scholarship. As Kenneth Surin states in his entry on Baruch Spinoza in *The Deleuze Dictionary*;

> In the last few decades the writings of Louis Althusser, Etienne Balibar, Pierre Macherey, Antonio Negri, Deleuze and others, have marked a resurgence of interest in the thought of Baruch Spinoza, in which Spinoza's … ontology has been used as a framework for constructing a matrix of thought and practice not regimented by the axioms of Platonic metaphysics, the epistemology of Rene Descartes, and the transcendental rationalism of Immanuel Kant and Georg Wilhelm Friedrich Hegel.

Titles like, *The New Spinoza,*[i]¥ *Spinoza's Modernity*,[ii]¥ and *The Savage Anomaly: The Power of Spinoza's Metaphysics and Politics,*[iii]¥ are merely the cusp of this evolving hermeneutic. And this trend readily seems to follow the gradient of history, from Theism, to Secularism and to the new surge of Integralism, and the resurging interest in ancient Nondualism. This integration is occurring between many dualities across the sphere of knowledge, but in Spinoza studies it is specifically occurring between "eastern" and "western" interpretations and between and beyond his intrinsic "rationalism" *and* "empiricism."

The Spinoza hermeneutic follows a gradient from reactionary theism—seeing the "god intoxicated man" as an atheist and heretic—to romantic pantheism, to scientific-materialist monism, and now, at the interface between the 20th and 21st centuries, we have the philosopher of univocity and infinite difference (in Deleuze), the radical modernist and rational-empiricist in Matthew Stewart, and—reinterpreting and integrating them all—we find Spinoza, the nondual trans-Rational empiricist herein.

Deleuze, like Nagarjuna, before him, implores us to think "acategorically," to "pulverize the categories" inherited through a past hermeneutic—the forces of representation—driven by the distorting effects and purposes of power.[iv] This acategorical or aperspectival thinking is the injunction required to explore this Deleuzian "alternative lineage that challenges the Hegelian concept of the dialectical progression in the history of philosophy," as Duffy states. He quotes Deleuze, from *Difference and Repetition*, giving a general

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[i] ¥ (Montag and Stolze)

[ii] ¥ (Goetschel)

[iii] ¥ (Negri)

[iv] It was Jürgen Habermas who explained how power necessarily distorts the channels of communication.

outline of the Deleuzian project (and please note that it is *clearly* nondual in purpose):

> The task of modern philosophy is to overcome the alternatives [:] temporal / nontemporal, historical / eternal and particular / universal. Following Nietzsche we discover, as more profound than time and eternity, the untimely: philosophy is neither a philosophy of history, nor a philosophy of the eternal, but untimely, always and only untimely — that is to say, "acting counter to our time and thereby acting on our time and, let us hope, for the benefit of a time to come."[i¥]

Indeed, Deleuze's "task" he set for Philosophy echoes the task that Nagarjuna set for himself, in his "philosophy of the middle-path," which was to overcome the dominating philosophical dichotomy of his time, to pulverize the categories dividing the "eternalists" and the "nihilists."

Duffy continues [my notes]:

> Rather than … providing a representation of Spinoza's metaphysics, Deleuze instead wants "to put [Spinoza's] metaphysics in motion, in action … [to make it] carry out immediate acts." [Deleuze] therefore does not offer an alternative representation of the movement of the Hegelian dialectical logic but rather an alternative logic [in place of the Hegelian dialectic] that is "capable of affecting the mind outside of all representation," a logic capable "of inventing vibrations, rotations, whirlings, gravitations, dances or leaps which directly touch the mind" [and this is the goal and power of Interface Philosophy with its deep roots in the tools of nondualism and esoteric rationalism, as operationalized through the use of sensation and the Vision-Logic Coordinate System]. [ii¥]

Not only does Deleuze trace out an alternative lineage in philosophy, but in so doing, he necessarily traces out an alternative lineage in mathematics, specifically of the calculus. This is because (among other reasons) with the rationalists, philosophy and mathematics were deeply intertwined. Duffy says this "alternative lineage in the history of mathematics is implicated in Deleuze's alternative lineage in the history of philosophy by means of a convergence between the logic of the differential [in the calculus] from the differential point of view of the infinitesimal calculus and the logic of expression," all of which we will explore and expand upon in much greater depth in the section on the calculus.[iii*]

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[i]¥ From Duffy's notes, "*DR*, xxii. The Nietzsche citation is quoted by Deleuze from: Friedrich Nietzsche, 'On the Uses and Disadvantages of History for Life', *Untimely Meditations*, trans. R. J. Hollingdale (Cambridge: Cambridge University Press, 1983), p. 60."

[ii]¥ Quotes from, *Difference and Repetition*, p. 184., qtd. In Duffy

[iii]* See Reconnecting the Lost Thread of Mathematical Rationalism: Spinoza, Leibniz, Immanence and the Calculus, p400.

In the abstract to his article (*The Logic of Expression…*) Duffy writes:

> Spinoza's philosophy should not be represented as a moment that can be simply subsumed and sublated within the dialectical progression of the history of philosophy, as it is figured by Hegel in the *Science of Logic*, but rather should be considered as providing an alternative point of view for the development of a philosophy that overcomes Hegelian idealism. Indeed, Deleuze demonstrates, by means of Spinoza, that a more complex philosophy antedates Hegel's which cannot be supplanted by it. Spinoza therefore becomes a significant figure in Deleuze's project of tracing an alternative lineage in the history of philosophy, which, by distancing itself from Hegelian idealism, culminates in the construction of a philosophy of difference. Deleuze presents Spinoza's metaphysics as determined according to a 'logic of expression', which, insofar as it contributes to the determination of a philosophy of difference, functions as an alternative to the Hegelian dialectical logic.

And Duffy ends his article with:

> The strategy of reading the *Ethics* as determined according to the logic of expression marks not only the originality of Deleuze's interpretation of Spinoza, but also one of the points where Deleuze can be considered to depart from the Hegelian and Cartesian Spinoza familiar to scholars working in the field of Spinoza studies, by tracing an alternative lineage in the history of philosophy that expresses the convergence between Spinoza's ontology, the mathematics of Leibniz, and the metaphysics of [Duns] Scotus. The Deleuzian domain of engagement with Spinoza is determined therefore by deterritorializing a fairly traditional reading of Spinoza from a particularly Cartesian and Hegelian point of view to that of a more Scotist and even Leibnizian point of view.

Clearing Away the Dust of the Great Chain of Being

The traditional exoteric/academic post-Kantian view of the history of philosophy passes on an interpretation of Spinoza which emerged, like a rumor, through a distorting chain of influences; from a collapse into Cartesianism, to disfiguring interpretations by Leibniz, Kant, Hegel, the empiricists, the romantics, the existentialists and finally to the post-modernists. This collective interpretation serves mainly to *disfigure* the "expressive" body of Spinozism, according to Deleuze, rather than to *illuminate* it, or make it come alive within its own plane of consistency.

For example, the popular book *The Great Chain of Being*, by Arthur Lovejoy, compresses all of pre-Kantian philosophy into a metaphysics identical with the medieval notion of the Great Chain of Being (GCB). This GCB view, as Ken Wilber expresses it, accepts the idea that "pre-given," Platonic, eternal and unchanging ontological forms, structures, levels, essences or gradations *pre-exist* the actual objects and/or subjects of existence. This presents an essentially Platonic chain or ladder of

absolutized concepts, templates, Forms and categories which all phenomena supposedly emanate out of and can be forced into; we descend into the Great Chain of Being from a perfect transcendent God (above and beyond all else), to lesser and lesser gradations of spirit, through mind and ultimately to the crudest pre-existing forms of matter.

Spinoza's philosophy—as interpreted through Deleuze's "organizing principle" of univocity—while naturally inheriting some of the simplistic *terminology* of the Great Chain of Being metaphysics, fits this medieval system like a giant squid might fit into Procrustes' infamous bed. Tentacles chopped off here, a beak poked in there, and even the tip of the head lopped off—all to fit the historical function of this crude medieval device—to force a needed perspective into the history of philosophy, providing a distinct line centered on Kant's "critical philosophy," and pushing the disturbing implications of Spinoza's radically "ungrounded" modernism into the archaic past.

For example, (and note that all of the following we will explore in much greater depth later), Spinoza's "God" is not a pre-existing transcendent *form* (although Leibniz's *exoteric* God arguably is). It is, rather, both immanent (intrinsic or indwelling) *and* transcendent, operationalized herein, epistemically, as merely a transcendent emphasis on a boundless, or "empty," "immanent-transcendent axis."[i]* In other words, Spinoza's God is not the top of any chain of *pre-existing Platonic forms* levels or planes of perfection or existence, as is *absolutely central* to the idea of the Great Chain of Being. Indeed, Spinoza's God is no form whatsoever, but the *opposite* of any form at all. His God is ultimately merely identical with The Absolute Infinite, or the positive (non-regressive) notion of infinity as "the secret of Grand rationalism," an idea which Deleuze adopts from Merleau-Ponty. Spinoza's God/Substance is "The Boundless," the ineffable Absolute and, in this sense, identical with Nagarjuna's Emptiness in polar opposition to Form.

Spinoza's metaphysics *has no* pre-existing or eternal ontological *structures*. That is the whole point of the expressive polarity between his "substance" and its "modifications" or "modes."[ii] Substance and/or God, in Spinoza, is not a form or a structure. It is not even the "formless," as in the homogenous or amorphous, because formlessness is a type of form. Substance is defined in the "escape" from modal (structural), finite and relative thinking—in the medieval and foundational infinite regress—to the acceptance of the foundationless, and boundless Emptiness of The Infinite, or The Absolute (the ineffable "absolute scope" and the positive infinity of the rational) and Spinoza's immanent causation. Spinoza's modes are always ontic (*really* existing *relative*) structures (as are Wilber's holons), but

[i]* see, The Vision-Logic Coordinate System (VCS), p123

[ii] Expressed through the "cultivated third" of the attributes, seen herein as specialized functions of the nondual concept of "dependent origination."

(also like Wilber's holons) they are *not* eternal, pre-given and Platonic. Rather, modes are always *relative* forms *emergent within time* and their *ultimate* essence is never their own, but shared univocally and inter-expressively with all other modes of the univocal Substance. The individual essence of any Spinozan mode, as we will see, does not precede its existence, but is a function of its emergent *homeostatic* nature to "persist in its own being."[i]* Forms—or modes, in Spinoza—participate in eternity only insofar as they recognize and embody the understanding of their ineffable and boundless source in (Nagarjunan/Spinozan/Deleuzian) logical-Emptiness. This concept of "real difference"—as opposed to numerical difference—in Spinoza, gives all forms and modes a necessary dependent arising, in direct opposition to the Cartesian system rampant with numerical or absolute distinctions, such as his duality of substances. Indeed, it is this Spinozan concept of difference as a dependent arising that turns all of Descartes' axioms against him, turning his Dualism into a nondual Rationalism.

There is, then, in Spinoza, no Great Chain from matter, to mind, to the various forms and gradations of spirit. Indeed, this is the entire purpose of Spinoza's polarity of "attributes," Thought and Extension (mind and matter, within and without, or "I" and "IT," respectively), which apply to all finite and emergent forms at any level of "excellence." This notion of the attributes as expressing the essence of infinite Substance in the distinction between fundamental perspectives—generally the within and without—is a very common interpretation among Spinoza scholars and enthusiasts. It can be found everywhere from Albert Einstein, to Darren Staloff,[ii] to Will Durant.

Spinoza does not collapse Thought to Extension, nor mind to matter, but maintains a critical parallelism and polarity. Indeed, this polarity—or identity of opposites—of the attributes, and this concept of real difference enforcing a dependent arising of all form, is precisely how Spinoza converted the Cartesian *dual* rationalism (and largely a pre-rationalism, as we will see) into a fundamentally *Nondual Rationalism*.

And hence, the lumping, by Lovejoy, of all pre-Kantian ontology into the term "metaphysics"—disparaged and devolved from the revolutionary insights of the key *esoteric* rationalist and modernist, Spinoza, to an absolutized categorical mythology, straight from the dark ages—is indeed a procrustean bed which served more to give power to the reactionary critics of radical modernity and Rationalism (the Idealists and post-modernists) than to accurately interpret the key rationalists on their own terms, and from their own plane of consistency.

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[i]* See Univocity and Essence, p170.

[ii] Staloff calls the attributes the "descriptive protocols," as we will explore both the descriptive and the formative aspects of the attributes more deeply in the section Spinoza's Attribute Polarity and the Nucleation of Observability, p486

POST-POST-ISM-ISM: CONDITION-CRITICAL IN THE ONTIC-SHADOW OF POST-KANTIAN DUALISM

Post-post-ism-ism is a "critical" condition running rampant through the body of post-post-modern Philosophy. It's Kant's fault … or the fault-line of those who interpreted and transformed his critical philosophy into a respectable profession fit for the LCD[i] of exoteric academia. Kant, like Descartes, set himself the task of reconciling science and religion, and protecting each from the other—"Am I going to have to separate you two?" And like Descartes, Kant's procedure was a radical division, a dich-otmy between two zones of the Philosophical body. Both Kant and Descartes had the best of intentions, but you know what they say about the road to Hell…

Descartes' project merely ended up in an inside-out bicameral fissurotomy[ii] between the mind and the brain. No problem, we've just about recovered … finding little tricks to get the two halves to (feebly) interact again. Kant, however, accidentally ended up nearly severing the Philosophical body from its head.[iii] Beyond the poetry of this metaphor, we will come to find that the very core of the epistemic emerges at the *crossroads* of these actually orthogonal dualities—cultivated into their respective polarities and triune-interfaces.

The head of Philosophy, in this metaphor, is *representation*—the epistemic, the *real* illusion—while the body of Philosophy is *sub-representation*—the ontic, the *real beneath,* or prior to the illusion. After Kant's "radical ontotomy," the patient of Philosophy will never be the same. But it was this decapitating fault-line that allowed post-Kantian Philosophy—now fully separate from the troublesome and unpredictable anima-mundi of the Body—into the gleaming, predictable halls of academic Science. There have been many brash young surgeons who have attempted the reconstruction, but this condition-critical has now been passed off as normal, the patient assumed healed and happy. It is now considered dangerous to Philosophy to

[i] Lowest common denominator…

[ii] The transitive (horizontal) severing of the subject/object polarity, as we will come to understand shortly.

[iii] The severing of the ontic from the epistemic on the orthogonal or vertical immanent/transcendent omni-axis, as we will see. This is the crossroads of the subject/object and ontic/epistemic polarities, on the transitive- and immanent/transcendent omni-axes, respectively.

attempt a re-connection between the dark sub-representational Body and the bright clarity of its representational Head.

The problem, we will explore near the end of this book, is that the ontic was early on con-fused with The Absolute. Kant split the ontic and epistemic into the illusory *phenomena* and the untouchable *noumena*. And hence forth, making an ontic claim was equated with making claims about the ineffable Absolute, or making absolute (dogmatic) claims in general—a waste of time and a serious symptom of dementia.

The solution to this aspect of the post-Kantian mishap, we will find, is simple, once the Vedantic doctrine of the Two Truths is allowed as a distinction between the relative and absolute scopes—allowing the ontic to regain its healthy esoteric capacity as the *real* and *relative* world of sub-representational *form* it always was (Brahma), and the epistemic to be the *real illusion* (Maya) it still wants to be.[i]* It was this holarchy between relative-reality and real-illusion that Kant's radical ontotomy, perhaps accidentally, rendered asunder. And ontology and its rational and transrational truths have been languishing in the obscurity this post-modern, ontic-shadow ever since.[ii]*

Another problem with the post-Kantian aftermath is that it is generally considered that Kant drew the line at the bounds of experience, beyond which metaphysics and ontology could not *rationally* go. This is not the case at all. Indeed, Kant—one of the most hyper-Rational (borderline pathological) of philosophers—was himself doing ontology and metaphysics far beyond the limits of experience. In fact it is generally known that Kant's absolute categories of the understanding themselves seem to have been derived arbitrarily with little logical justification, and as function of his language. Indeed, it is also well-known that Kant, newly "awakened" from his "dogmatic slumbers," was roused to rescue metaphysical certainty itself from the universal acid of Hume's radical skepticism which reduced everything to the mere coincidences of appearances. As the historian Will Durant says, the "Critique [of Pure Reason] is not precisely a criticism, but a critical analysis. Kant is not attacking 'pure reason,' except at the end to show its limitations. Rather he hopes to show its possibility and to exalt it above the impure knowledge that comes to us through the distorting channels of sense."

Where experience could not go, Kant echoed the Rationalists, we must resort to logic and reason. Indeed, Kant used reason to explore the very

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[i]* See the section, Interface Epistemology: A Preliminary Sketch, p541.

[ii]* For the continuation of this metaphor, see the section, Condition Still Critical: Waking Up from the Post-Op Nightmare of the Kantian Radical Ontotomy, p545.

limits of reason itself. Through logic and rationality he plumbed the *very nature*—the *reality* beneath the experience—of the thinking and knowing, rational mind. He was exploring the *ontology* of rationality or "pure reason," and what he found was knowledge *prior* to experience, i.e. innate knowledge in the form of what he considered absolute categories, actually a metaphysics upon which to firmly ground the relative certainties of science.

The forms or categories of reason (logic and sensibility or intuition) were, for Kant, *transcendental* or *a priori*, meaning they exist and find their justification for existence before or *prior to* experience (this is more precisely immanent rather than transcendent, as we will see, however). Experience itself, Kant argued, cannot exist without these ontic categories of the epistemic.

As is commonly acknowledged even in academia, Kant was turning metaphysics into a science. For Kant, Metaphysics in the bad or unscientific sense, was reasoning or simple belief beyond the means or categories of *understanding*, not beyond experience itself. This bad metaphysics is *dogma*, not rationality and surely not ontology, given that Kant himself deduced his own fundamental categories ontologically and as ontic forms at the very *nature* of the knower himself. (To be sure, it is only because the ontic and epistemic form a polarity and indeed a holarchy that to practice fundamental epistemology—e.g. seeking the *nature* of the knower—is to practice a form of ontology.)

The Gyth of the Miven

As we will also demonstrate, Kant was chasing a chicken-and-egg problem, and he had to draw the line somewhere relevant to the human dilemma he was facing. Experience and reason cannot be reduced one to the other, however, not even to Kant's "fundamental" (and arbitrary) categorical eggs of reason. There is no *ultimate a priori* line to be drawn (nor immaculate eggs to be found) in the ontic sand of the *nature* of pure reason.

As Matthew Stewart writes in his comically serious *The Truth About Everything* [[my comments]]:

> Two related stories about Kant are important to most histories of Philosophy. The first is that Kant marks a radical turning point in the history of metaphysics. The philosophers before Kant, so the story goes, were concerned to develop metaphysical systems, and Kant demonstrated that such systems would never work. The second, more specific story is that Kant proved that knowledge is conditioned by the nature of the knowing subject, or something of the sort. Kant himself told this story. Borrowing an expression from Hume, he proudly announces his own "Copernican Revolution" in philosophy. Prior to Kant, humankind had apparently been under the impression that knowledge must conform to the nature of the object [[the "myth of the given"]]. Just as Copernicus had shown that the earth revolved about the sun, and not

> the reverse, so Kant supposedly proved that the object of knowledge must conform to the subject's faculties of knowledge, and not the reverse.
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> … These stories about Kant are myths. The Kantian philosophy is not a real turning point in the history of philosophy. It is a continuation of the project of which the metaphysics he criticizes is merely one possible expression. … Most of his philosophy can be understood as a reenactment of what I have grandly called the dialectic of empiricism, which is itself an instance of the search for the Holy Grail of Philosophy. To be sure, Kant had a huge influence on subsequent philosophers, especially on the breed who would become the professionals of the modern university. But this just means that his name is useful as a collection point for a host of beliefs and reconstructions, mostly based on misunderstandings.

This may indeed be somewhat of an exaggeration, but there are certain truths in this account as well. Indeed, we will find Kant's dichotomy between the Rationalists and Empiricists entirely ill-fitting, when it comes to Spinoza, and thus all the arguments against Spinoza via his status as "Rationalist" will be found suspect as well.

The limits Kant imposed on experience were themselves purely *anthropocentric*, and in this sense *decidedly* anti-Copernican. Copernicus *removed* Man and his earth *from* the center of the Cosmos, whereas Kant *placed* Man and his faculties *back into* the center of Philosophy, where he had been with the sophists before him, for example. Kant's exemplar was also the Newtonian revolution, of which he was a champion. But it was the Einsteinian upheaval after him which—while simultaneously refuting his *a priori absolute* of Euclidean space and Newtonian physics—demonstrated that all bodies, such as the earth, are indeed the center of their own warped spaces, just as man is the center of Kant's universe. Unlike Kant, however, Einstein showed that the objects of physics and their warped fields are One. The objects do not simply generate their fields, anymore than the fields generate their objects. They arise together. In Einstein's universe, an object of matter is a congealed field, tied into self-stabilizing knots of energy. This is similar to the principle of complementarity in quantum physics. Particles no more can be reduced to waves than waves to particles. They co-evolve and co-create one another in the very same act. And in this same self-aggrandizing sense, after the "Einsteinian Revolution" of Interface Philosophy, subject and object (or given-myth and mythic-given), necessarily arise together, in a structural coupling or symbiogenesis, of sorts, as we'll see.

In effect, Kant created a *metaphysics of experience*, with his metaphysical and ontological *a priori* (immanent) and "transcendental" categories of experience. This metaphysics itself is often used—post-Kan't (sic)—to *deny* pre-Kan'tian metaphysics based on the assumption that these earlier systems necessarily go beyond the categories of experience and thus cannot be verifiable and scientific. Kant, however, outlined an entire set of

categories based in the *a priori* understanding—his Transcendental Logic. These include causality, relation and even substance. Thus if a metaphysical system uses logical relation and causality then that system is verifiable by the means of logic and causality which are themselves *a priori* categories of experience. And, as we will see, these categories themselves are derived through a deep coupling with experience *prior* to the human modes of experience to which Kant had set his anthropocentric, chicken-and-egg limits. This logical or relational verifiability is in the same way that a mathematical proof cannot be verified by empirical means but only by means interior to its logical relations. Indeed, the notion of infinity itself is purely logical and thus entirely amenable to the understanding, and this understanding underlies all of Kant's supposed antinomies. Infinity is simply boundless, in any of its forms. It is only the limited *imagination* that cannot fit the unlimited infinite into its domain. But the forms and details of logic are not bound by the perspectival restrictions of the imagination any more than is a mountain restrained in size by the horizon. And thus a metaphysical system is open to demonstrations and relations of the infinite so long as it unfolds its relations in a consistent and coherent manner. But then it can only "prove" its conclusions in the realm in which it is limited, namely logic and relation, as opposed to empiricism and objectivity insofar as our inter-objective experience with mathematics and logic is neglected.

Kant wanted to find out what happens when "pure reason," beyond the limits of human experience, confronts only itself, but Kant's *own* pool of experience was far more limited than ours today. Kant was unaware of the empirical facts of evolution and of the embryogenesis of the forms of the understanding far prior even to his *a priori* categories. In the light of this new experience with the natural world—e.g. evolutionary and cognitive science—we will find that experience and reason emerge *together*, symbiogenetically, or structurally coupled, in the very process of evolution. The "fundamental" categories are themselves inherited from billions of years of *experience* with the problem-solving intelligence (primitive rationality) of evolution. The "forms of sensibility," we will see, are not ultimately *a priori*, in the anti-Copernican anthropocentric sense, but *symbiogenetic* with the *sensations* or experience of form. And one of the core elements of reason is the rational "acategorical imperative," which, by itself, pulverizes the categories required by dogma.

Kant shattered the "myth of the given," and handed us merely the "given of the myth," the given of the ontic forms underlying the illusion of experience itself. His self-proclaimed "Copernican Revolution" demonstrated that the world is not simply *given* to the mind as it is *in itself*, but that the mind, as it is in itself, is given to experience and interpret the world. The mind, according to Kant, generates and imposes its own pre-given *a priori* structure and order (e.g. the categories of Time and Space) on the world before it can experience anything.

This is thesis and antithesis—from the mythic-given of sub-representation, to the given-myth and "benign user-illusion"[i¥] of the *a priori* forms of representation. The synthesis is naturally the interface between the two. As Hegel would say, "The laws of logic and the laws of nature are one. And logic and metaphysics merge."[ii¥] It is not the mind itself from whence the *a priori* categories arise. This is simply because the mind does not, and indeed *cannot*, exist by itself. The mind and the world are not ultimately *other*, but two forms of the same inter-expressive sub-representational "stuff," and as Bodhidharma says, "vision arises where they meet." They interact through deeper forms of inter-expression or causation common to both. The conscious mind does not generate these deeper forms and it does not create itself, but it is actually given by prior form. It is emergent from deeper emergents of deeper emergents, perhaps *ad infinitum*.

The mind then does not, of itself, *create* Time and Space and simply project them onto the timeless and spaceless world. But through its *interface* with the inseparable world of real duration and real relation—with which it is *One*—the categories of sensibility and the understanding are differentiated into abstraction in the very process of the formation and deepening of experience long before the human level of complexity arises. The mind can only know relation—as opposed to the absolute "thing in itself" free from relation—because there is *only* relation to be known—infinite relation, "pure" relation—of which knowledge is emergent or transcendent from sub-representational form.

As seen in the categories, Nature herself is given *as* the mind and *to* the mind to experience in its interface with the world, a part of itself. Or—to render it from the other side—the world gives itself experiences of itself through its interfaces with its minds. The experience of the "myth" is simply the interface between the two forms of the "given" emergents. Maya is the experience in the interface between the inner and outer Brahma. This within/without boundary is ultimately the interface of the positive infinity itself,[iii*] an infinite axis first broken open into operation in philosophical and mathematical rationality, as we will see. So it is only with a proper and esoteric understanding of rationality that this interface can be assimilated into a healthy *trans*-rationality.

[i ¥] … from Daniel Dennett

[ii¥] Qtd in Will Durant, *The Story of Philosophy.*(Durant)

[iii*] See I/T Interfaces, the Omni-Uni and the Omni-Non, p146.

The Kantian Legacy: "Rationalism" vs. "Empiricism"

Perhaps the most problematic consequence of the Kantian legacy is the divide-and-conquer pigeon-holing methodology he used against his immediate historical predecessors—especially Leibniz and Spinoza—forcing them into his procrustean bed of rationalists vs. their opponents, the empiricists. As Matthew Stewart writes in *The Courtier and the Heretic*.

> In the histories of philosophy that dominate the trade, it was Immanuel Kant who sealed the fate of the two greatest philosophers of the seventeenth century. In his effort to tame philosophy into a discipline suitable for the modern academy, Kant trained his attention on the methods whereby philosophers purported to justify their claims to knowledge. He divided his immediate predecessors into two groups: the empiricists, who allegedly relied on sense experience to base their claims to knowledge, and the rationalists, who were said to derive their truths from pure reason. According to Kant's peculiar scheme, Leibniz and Spinoza wound up playing on the same side of history. Together with Descartes—the man Leibniz loathed and Spinoza regarded as seriously confused—they became the three rationalists. Leading the empiricist opposition was John Locke—the same whom Leibniz regarded as a wobbly crypto-Spinozist. He was joined by the Irish philosopher George Berkeley, whose view that physical objects are only ideas in the head strikes most readers as distinctly unempirical, and David Hume, whose ideas about the mind and causality look remarkably like those of Spinoza.
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> Hegel, who very much liked to see history move along in groups of three, strongly championed Kant's version of events; and the British, who were pleased to see a trio of their greatest philosophers of the period lined up against three continental musketeers, were more than happy to go along with the story, too. As a result, in philosophy classes to the present, where irony tends to be a scarce commodity in any case, Spinoza and the man who dedicated his life to expunging Spinoza's name from the world's memory [Leibniz], are presented as happy partners on the same side of a debate about the epistemological foundations of academic philosophy. Only very recently have scholars begun to rescue Leibniz and Spinoza from the revisionist schemes of their philosophical successors.
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> In the conventional histories of philosophy, Leibniz and Spinoza ultimately fall victim not to progress but to the idea of progress—an idea that first gained currency toward the end of the eighteenth century and that has since been taken up with gusto by all those who have a stake in presenting philosophy as a respectable, quasi-scientific discipline. Once we set aside suspect narratives of the history, however, it becomes clear that, far from being left behind by their modern successors, Leibniz and Spinoza remain unsurpassed today as representatives of humankind's radically divided response to the set of experiences we call modernity. Much of modern thought simply wanders in the space between the two extremes represented by the men who met in The Hague in 1676 (p309-10).

"Post-Metaphysics" and "Post Ontology": An Acategorical Stance

Along with tacitly following Arthur Lovejoy in lumping most, if not all of pre-Kantian metaphysics with the Great Chain of Being, Ken Wilber defines 'metaphysics,' "in the bad sense" also as a postulation of ontological entities which cannot be empirically proven by science. Ironically, this would place much of science (and its hidden *Foundational* metaphysics)—such as "[insert your Ultimate Fundamental Object here] Theory," and Cosmology—in the category of "bad metaphysics" or bad ontology. They all do indeed make fundamentally unjustifiable and unproven claims about the very nature of reality.[i]

This problem, to me, is part of a subtly imprecise, reactive and ontic-shy, inherited definition of post-metaphysics, in this post-Kantian era of rampant post-post-ism-ism. There are clear and restrictive limits on empirical reality that science and logic must at least attempt to move beyond. Indeed, science does this all the time, and of necessity, as does Integral Post-Metaphysics with its logical necessity of an infinitely deep holarchy of *ontically real* holons.

Language, Buckminster Fuller tells us, was the first industry. It is based on the collective technology and invention of the word. Likewise all "language games" are forms of technology.[ii] And as we would expect from the dialectic of progress, any technology that can be used, can also be *ab*used. The technology of metaphysics is no exception. Metaphysics is abused, as Kant noted, in the taking of dogmatic stances, in postulating ABSOLUTELY the existence (not necessarily the existence of the absolute) of entities that cannot be proven. And more to the point, bad metaphysics is the absolute belief in these entities despite its detriment to the rationality and well-being of the user.

Post-metaphysics, and post-ontology, if it is to emulate the objectivity of science, cannot be fundamentally opposed to merely *postulating* ontically-real entities that cannot be proven empirically, because this is a necessary function of science and philosophy at the limits of the augmented senses—in the zone of pure-reason. Again, Kant himself identified the forms of logic and the forms of sensibility as the forms of understanding itself necessary to understanding *anything*. Mere hypothesis is not a belief system in itself, and if we restrict ourselves to the merely empirical, then we end up with a variant of logical positivism that no longer dares to wonder about what lies

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[i] Indeed, there is a rampant Foundational metaphysics hidden under much of Science, despite the fact that Foundational truth-claims—a main feature of medieval Philosophy and Theology—have been demonstrated extremely problematic and indeed illegitimate during the last century of Philosophical progress.

[ii] … or "life-forms" as Wittgenstein called them.

beyond the provincial pale of the augmented senses. A sad and safe little representational world would that be.

In any Integral and post-postmodern model, rationality should be transcended-*and*-*included*, not transcended-and-negated. Rationality is a tool, and as we will see, its very core contains the thread of an "acategorical imperative." Thus—as demonstrated very clearly in the violently corrosive encounter between medieval dogma (metaphysics in the bad sense) and Spinoza's nondual-rational philosophy—the very nature of truly rational metaphysics points directly *into* a post-metaphysics, and a post-ontology, beyond the dogma of the absolutized category. It is in the nature of the rational mind to leave itself open *endlessly* to new questions and analyses, and not to end on some given dogma. Dogma occurs when the acategorical truth of rationality breaks down into the irrationality of unwarranted and detrimental belief.

Post-metaphysics and esoteric rationality is then a post-ism-ism. It is still a post-mythology, but it opposes a *rationality*-turned-mythology—a rationality twisted from its intrinsic acategorical stance to the ends of pre-rationality and its transcendent-biased absolutized categories and power structures. In short, post-metaphysics and esoteric rationality opposes the absolute category, and not necessarily the category of the absolute, as we will see. Esoteric rationality is the acategorical imperative of the open question. Its goal is to transcend the post-Kantian ontotomy of the Body of Philosophy in its radical attempt to divorce itself from the isms and dogmas of the careless skeptics and priests.

The categories of metaphysics, in Nondual Rationalism and Interface Philosophy—as in Integral Post-Metaphysics—can no longer be absolutized into a dogmatic stance, not even the absolutized-relative dogma of radical skepticism. Indeed, Nondual Rationalism, and especially Interface Philosophy, can take on any metaphysics whatsoever while maintaining the relative status of its truth claims. Metaphysics in Interface Philosophy, becomes a categorical or conceptual operating system or merely an application or program—a conceptual interface of *relative* categories. Install if you wish, and take it for a test run, but be aware that it is only an interface between you and the hardware of reality, and that you may have to perform a hard reboot if it fails.

Thus, post-metaphysics is not *ultimately* a feature of the metaphysical system itself, but a cognitive or conceptual aperspectival stance which imposes an acategorical imperative—a meta-metaphysical and meta-categorical framework—in which the absolute truth claims of any metaphysics are suspended in the relative world of justification, partly through the rational truth that all truth claims may be subject, endlessly, to further analysis. Indeed, this unbounded stance of analysis is at the very core of the synthesis of Nondual Rationalism, as we will see. It is a resonant

thread to the positive infinity and secret of Rationalism. And, as we will see, the Vision-Logic Coordinate System and the Univocity Framework, form a meta-metaphysical framework within which metaphysics can find no foundational ground with which to dogmatize and ism-ize itself.

For example, while it may indeed be true that Spinoza believed in his system as ultimately True, it may also be true that in his age of rampant dogma, a *deep faith* in one's own way *out* of dogma was essential to his emotional, intellectual and even to his physical growth and survival. It is also the case, however, and critically so, that nothing in Spinoza's philosophy *depends* on any absolute belief whatsoever; as Deleuze says, even Spinoza's ontological proofs are "not hypothetical, but genetic."[i¥] Spinoza's ontological proofs do not attempt to prove a transcendent God, as do Leibniz's. They show how the relative *concept*, interfacing with the absolute, is properly, logically, consistently, rationally *and non-dually* generated.[ii] Spinoza's philosophy does *not* rely on the *belief* in the properties of an existing entity. It merely shows how to consistently and non-dually define it. Indeed, as we will see, Spinoza renders the truths of the nondual traditions into the logic of rationality. The positive infinity and secret of rationalism is the logical equivalent of Nagarjuna's Emptiness, while Spinoza's concept of real difference is the logical equivalent of dependent arising. Spinoza shows *how and why* the truths of nonduality are entirely compatible with the truths of rationality, and indeed *how and why* they are unavoidable and unassailable for any logical and rational mind.[iii*]

Indeed, it will be shown herein how and why the positive infinity of the rational does not give rise to antinomies, as Kant thought, but that the necessities of logic and relation demand the existence of the infinite. Regardless of whether the infinite can fit into the finite or indefinite *imagination* of man, it can very simply fit into his logical and rational understanding, itself informed in deep evolutionary symbiogenesis with experience, intelligence and memory. To be sure, only through affirming and incorporating the necessity, in the rational, for the infinite can the nondual synthesis between the relative and the absolute be truly accomplished. Just as only through incorporating the necessity of Emptiness in form, at some level or zone, can the nondual begin to present itself.

Spinoza demonstrated that there is a valid way to *generate and conceive* the nondual absolute in the crystalline rigor that the geometrical method of the *Ethics* helped to provide. More than he *believed* in his absolute

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[i¥] Deleuze, *Expressionism in Philosophy*, p79

[ii] We'll see this more explicitly through our "embryogenesis of the concept" in the section Spinoza: A Nondual Sketch, p664.

[iii*] See Spinoza: A Nondual Sketch, p664.

knowledge of its properties, he believed in the rigor of its underlying form and nondual truths, as well in the transformative power in its theory of emotions. Spinoza was a test case of his own model, and in the history of Western philosophy there is no better example of a philosopher who lived, practiced and embodied his philosophy. His theory of the emotions, Spinoza declares, helped him to achieve "blessedness" or transcendence from the passive into the active emotions in the "intellectual love of God."

The rational stage of development gives us the open-ended tools of logical synthesis and analysis. Any Integral and post-metaphysical system, therefore, must transcend-and-include these tools to make it successfully and fully into a healthy stage of trans-rationality. But it can only do so if the rational tools and truths themselves are properly developed. We will find, however, that the tools of rationality were buried under layers of mis-representation. They lay rusting, trampled under-foot in the dirt of obscurity. Resurrecting and expanding this tool-set is part of the project of this work, in order to properly and much more powerfully transcend-and-include the truths of the rational into the trans-rational free from the post-Kantian ontic-shadow.

Thus, we can state that part of the definition of the trans-rational and post-metaphysical must be the abstinence of making truth claims contrary to, or without regard to, the truths of the rational stage of development. And we can also state that such a system must be in accord with the available evidence and methodologies from the scientific and empirical world. Where no empirical evidence exists, then, we have only the tools of logical synthesis and analysis, along with trans-rational intuition. Those metaphysical systems, such as Dogmas, that run counter with the injunctions of the cognitive tools evolved so far are therefore "metaphysics in the bad sense."

Aside: A Wilber Encounter of the Third Kind

After getting to know Ken Wilber—working directly with him at his Integral Institute for the past two years—I dearly love and greatly admire the man. But he is, after-all, a man. And when the exalted authority of one man stands in the way of the emergence of pragmatic and logical truths in another, less known sphere, this authority must be questioned. It is in this healthy and loving way that I attempt to inform the exoteric Received View of Spinoza in Wilber's work with my studies in esoteric rationalism .

In a recent encounter[i¥] with Ken, he made the claim that Spinoza's philosophy could not be post-metaphysical because Spinoza himself was not enlightened. But Wilber also makes the claim that Spinoza was "by his own admission a dedicated Cartesian." Indeed, Spinoza wrote an early book on Descartes, within the confines of which he remained true to the Cartesian system, but only in order to render it and study it correctly. It is this early dedication to which Spinoza spoke, and to which Ken alluded. In Spinoza's mature work, as noted by most Spinozists, he went radically beyond Cartesianism.

I challenged Wilber on this claim, stating that the majority of Spinozists would disagree with the assumption that Spinoza could be classified as a dedicated Cartesian. He then promptly retracted it, with the off-hand comment that it was irrelevant to his points. On the contrary, it is precisely relevant. The fact that Wilber could not defend his own claim shows that he adopted the maxim second-hand, and perhaps has lost the context. Anyone who *really* knows Spinoza's philosophy—i.e. from studying him in depth, not just in passing on the way to a vast meta-theory of everything (and everyone)[ii]—knows that Spinoza was *profoundly* anti-Cartesian. This is why the Theosophists consider that Spinoza's philosophy, when reconciled with Leibniz's (reactive interpretation), would reveal the "spirit of esoteric philosophy" in ***opposition*** to the philosophy of Descartes.

Again, the esoteric understanding of Spinoza is profoundly anti-, or trans-Cartesian. Indeed, as Deleuze states in *Expressionism in Philosophy: Spinoza*, [my ***emphasis***] "…there is no Cartesian axiom [in Spinoza]…that does not take on a new meaning, ***hostile to Cartesianism***, on the basis of the new theory of distinctions. The theory has as its fundamental principle the qualitative status of real distinction. Detached from all numerical distinction, real distinction is carried into the absolute, and becomes capable of expressing difference within Being, so bringing about the restructuring of

[i¥] ISC call, May 12, 2007

[ii] Wilber's limitations here are to be expected of a human being, rather than a god. His net was cast wide and his focus was on the eastern forms of nonduality, not on "Rationalists," such as Spinoza.

other distinctions."[i¥]

The Spinozan theory of distinctions, as we will see, transforms the dualistic *independent* arisings in Descartes, ultimately into *dependent* arisings. This dependent arising is one of the key elements of nondual philosophy, and it is a necessary outcome of the acategorical imperative of esoteric rationalism itself, as we will see.

Given that Ken Wilber has not found the plane of consistency in Spinoza's philosophy—following his claims that Spinoza is a "dedicated Cartesian," *which he cannot back up*—then it is clear that Wilber has not properly followed the injunctions of the Spinozan paradigm.[ii] This assertion, then, that Spinoza was not enlightened, is a clear and uncharacteristic example of metaphysics in the bad sense. It is a truth claim about the *nature* (ontic) of Spinoza's mind that not only cannot *ultimately or absolutely* be verified, but one whose relative merits Wilber himself has not attempted to validate with the *relative* truth claims available to him, namely reading Spinoza to the point of *understanding*, or even reading the main Spinozists, rather than merely his critics. In order to assert that Spinoza was not enlightened one must first *understand* Spinoza, and when one understands Spinoza, one sees that he was anything but a "dedicated Cartesian." As Matthew Stewart noted, Spinoza considered Descartes to be seriously confused, as any nondualist to any dualist.

As we will see, there are many thinkers who have found enlightenment through Spinoza's philosophy and who feel indeed that Spinoza *was* enlightened himself. These are thinkers who have studied Spinoza in depth, i.e. thinkers who have followed the injunctions of the Spinozan paradigm, such as Arthur Schopenhauer, the Theosophists, and many others in both eastern and western nondual systems.

Post-Metaphysics and the Transcendental Injunction

Another key to the definition of post-metaphysics, then—as given by Ken Wilber—is that any post-metaphysics must have an injunction for transformation beyond the merely cognitive sphere of concepts. Wilber states that the Spinozistic philosophy cannot be post-metaphysical because Spinoza had no injunctions for transformation, say, in the emotional or "spiritual" sphere. Now, anyone who knows Spinoza knows that the sole

[i¥] Deleuze, *Expressionism in Philosophy*, p. 38

[ii] A paradigm is a function of technology, and a philosophical system itself is a technology; an invention based on the industry of language.

purpose of his philosophy was as a means to achieve blessedness in the "intellectual love of God."

As is well known in the history of philosophy, Spinoza did not *merely* philosophize, but he was among the few western philosophers to have *truly lived* his philosophy. This is why Deleuze calls him the Christ of philosophy, and the common image of him is that of a saint. Like Aurobindo, writing was itself a *practice* for Spinoza. But more than this, Spinoza's philosophy of the emotions—when *lived* as Spinoza *implored* his readers to do as well—was full of injunctions for moving philosophy into the practical sphere of emotional transformation, away from the "passive" or reactive emotions, to the higher "active" emotions such as the intellectual love of God. For Spinoza, as we will see, the emotional and the intellectual spheres were never separate. Philosophical injunctions necessarily transcended-and-included emotional ones. This is why Deleuze called Spinoza's philosophy a "Practical Philosophy." Philosophy, for Spinoza, was a *practice* for emotional, spiritual and intellectual development, none of which could ever be separated, because the intellectual love of God was itself an emotion manifesting the spiritual in the intellectual.

And further, Wilber states that maps of reality themselves can often be "psycho-active." Indeed, as the maxim goes, "right thought leads to right action." And it can easily be inverted, "right action leads to right thought." The I and the IT quadrant, for both Wilber and Spinoza, are symbiogenetic. One does not exist separately from the other, and thus what you do in one sphere influences the other, and back and forth simultaneously.

It is in this way, that Philosophy itself, if *lived* and *practiced*, can be an *injunction* and a psycho-active map for radical transformation. And, in my own case, art as well was a very powerful means for transformation, before the explicit emergence of my philosophizing. Philosophy practiced as an art, then, is perhaps even more powerful, given that it quickly removes the philosopher into an aperspectival stance from which to better philosophize and transform—turning ever new interior subjects into the exterior objects of art and writing.

PROLEGOMENA: NONDUAL RATIONALISM AND THE LABYRINTH OF THE CONTINUUM

The tao that can be told
is not the eternal Tao
The name that can be named
is not the eternal Name.

The unnamable is the eternally real.
Naming is the origin
of all particular things.

— Lao-Tzu, *Tao Te Ching*

THE TAO OF RATIONALISM: PULVERIZING THE CATEGORIES

What is Nondualism?

From Wikipedia[i¥] we find (my **emphases**):

> The term nondual is a literal translation of the Sanskrit term advaita. That is, things **remain distinct while not being separate**. … Nondualism can refer to one of two types of quality. One is the quality of union with reality, God, the Absolute. This quality is knowable and can be gained spontaneously and via practice of inquiry. A second quality is absolute by nature, or to put it in words, "conceptual absence of 'neither Yes nor No'," as Wei Wu Wei wrote. This latter quality is beyond the quality of union. It may be viewed as unknowable.

And continuing:

> the belief that dualism or dichotomy are illusory phenomenae.

In this work we are focusing on the knowable, or the relative and cognitive understanding of nonduality, as opposed to the absolute and ineffable aspect of the nondual. But we are approaching the nondual from the cognitive aspect rather than the experience of nonduality which can only be achieved relatively, and explicitly by advanced meditation techniques, or possibly in spontaneous peak-experiences of awakening or enlightenment.

This system, however, will explicitly reserve a space or a "scope" for the absolute and ineffable aspect of the nondual in order that the "inseparable distinction" itself can be maintained with clarity. This will give perspective, context and detailed relief to the *relative* understanding of the nondual in 'symbiogenesis' (other-engendering) with the *absolute*. And along with that, the space reserved, and softly enforced, will allow ontological speculation to arise and be entertained without allowing it to become absolutized, because the absolute-scope itself is formally beyond the polarities involved and necessary for conceptualization to occur. In short, this aspect of the system ensures that the relative scope is the place where concepts will unfold (such as the whole realm of form, including ontological conceptualization), while

[i¥] Wikipedia: nondualism

the absolute scope merely gives the relative its context and meaning through the identity of opposites.

The interpenetrating, or symbiogenetic use of opposites (embodied in the ancient Taoist yin/yang symbol)—wherein "things remain distinct while not being separate"—is called *polarity*, and it will be explored in great detail throughout this work. Polarity is the key cognitive element—indeed it is absolutely fundamental and ubiquitous—in the *Tao Te Ching*, long considered a seminal work in nondualism. The polarities found in the Tao Te Ching are manifold, from the masculine/feminine, power-through-yielding of the traditional Yin/Yang, to the inter-expressive and interdependent polarities of up/down, light/dark, sense/nonsense, good/bad, freedom/control, etc, etc.

Polarity is the "opposable thumb of the mind," and hence it is also ubiquitous and foundational in this work, as it unfolds the embryogenesis of the concept. As in the *Tao Te Ching*—Nondual Rationalism explores in depth the relative scope of nonduality in polarity, leaving the ineffable absolute scope pointed to, and poetically hinted at—indeed it is given an infinite and ineffable altar (the epistemic parameter of the absolute scope) to reside in—yet remaining necessarily unspoken, in and of itself. Our work herein is therefore centered on, and empowered through the use, and explicit operationalization of polarity—even as it unfolds and interfaces with the absolute scope itself. Polarity is the nondual aspect of Nondual Rationalism (or NDR).

Another key aspect of modern nondualism comes from Nagarjuna, also called "the second Buddha," by the Mahayana (Great Vehicle) traditions of Buddhism. Nagarjuna was a philosopher from 2nd century India who developed what is called Madhyamaka, or "middle-path" Buddhism. In the forward to "The Four Noble Truths," a famous talk by the 14th Dali Lama (Tenzin Gyatso), middle-path philosophy is described essentially as a polarity between absolutizations of the absolute and relative scopes. In Nagarjuna's time these took the form of, on the one hand, "eternalism"—the view that the *essence* of an object (say a form or a soul) is eternal and unchanging—and on the other hand, "nihilism"—the belief that all things are temporary, or ephemerally self-annihilating. Nagarjuna effectively says, along with Heraclitus, that only change or interdependence is eternal and unchanging—or, along with Spinoza, that the fundamental essence of an object is univocal existence itself (substance), which it interdependently and inter-expressively shares with every other object or phenomenon (ALL is ONE). In short, eternity is senseless without time, boundlessness or Emptiness is meaningless without Form, and ***vice versa*** on all counts.

This polarity between the absolute and relative also gives rise to the Two Truths Doctrine of Buddhism, a foundational element in Nondual Rational Epistemology, or Interface Theory.[i]* This, we will find, is foundational also to the notion of Univocity,[ii]* which Deleuze sees as the key element in his interpretation of Spinoza, and this will be operationalized as the polarity of *absolute* and *relative scopes*.

Toward the goal of laying out a middle-path between these extremes of relative nihilism and absolute eternalism (or essentialism), Nagarjuna developed a concept he called *sunyata*, or *Emptiness*, which essentially means that all manifestations of existence, what we might call objects or modifications, are *empty* of their own self-contained essence (i.e. they are empty of the metaphysical *essences* which Plato called *forms* or *ideas*). Nagarjuna, like Deleuze, basically implores us to think acategorically, and he even titled one of his later books, *Pulverizing the Categories*. Indeed, this common categorical, or essentialist thinking, is the "essence" (pardon the term) of the "forces of representation" which, Deleuze argues, have distorted the reading and interpretation of philosophy (mainly Spinoza and Leibniz, herein) throughout History via an essentialist and idealist (Platonic) lens. (This will be explored later through the explication of the concept of the transcendent-bias.)

This Nagarjunan (and Deleuzian) *pulverizing of the categories* is effected through what is called *dependent origination*, or *dependent arising*, in the sense that the essence of an object or phenomenon is not self-contained, but is fundamentally *dependent* on the context in which it emerges or arises. And specifically, all *opposites* are dependent on each other for their *identity* in the very process of origination. In Taoism, this idea is called the identity of opposites, and it is a key concept throughout this work.

At a deeper level, Emptiness and dependent arising can be seen as an inter-dependence between the absolute and relative scopes in the sense that all relativities, i.e. objects or manifestations, are not independent in themselves, but are *dependent* on Emptiness, or absolute ineffable existence, which includes the ALL, as ONE[iii] infinite and fundamentally interdependent, or inter-expressive multiplicity. This is the meaning behind Spinoza's univocal polarity of Substance and its modes, expressed through the triune interface of the attributes (We will explore this in much more detail in the section on Univocity and elsewhere). Or as the *Heart Sutra* puts it, "That which is

[i]* See, Interface Epistemology: A Preliminary Sketch , p541.

[ii]* See, The Univocity Framework (UF), p153.

[iii] As we will see in Unity and Nonduality (p239), this ONE is not to say that there could be TWO. Infinite or absolute unity is not numerical, because it is not relational. There is a very important difference between infinite and finite forms of unity, or the forms of unity from the absolute and relative scopes, respectively.

Emptiness is not other than Form, that which is Form is not other than Emptiness." This is the identity of opposites (polarity, not duality) of Emptiness and Form, or The Boundless and Boundary, or The Infinite and the Finite, or The Absolute and the Relative. These are all different polarities expressing (at least herein) the same basic meaning.

Nondualism, then, as far as it can be spoken (relative scope), is essentially the concept of polarity, and this polarity takes many forms and is found in many directions and trajectories of thought; from the fundamental (vertical) absolute/relative polarity of Emptiness and univocity, to the (horizontal) mind/matter, up/down, left/right, good/bad, warm/cool, etc, etc, representational polarities populating the Tao Te Ching, and even to the Maya/Brahma, (Illusion/reality, or ontic/epistemic) polarity of ancient Hindu, and modern Western Philosophy.

What is Rationalism?

As Matthew Stewart says in his *The Courtier and the Heretic* (my **emphases**):

> In the most widely accepted versions of the history of philosophy, Spinoza and Leibniz are understood to represent a speculative metaphysical program that long ago succumbed to academic progress. In fact, talking a broader view of events, it is clear that the two greatest philosophers of the seventeenth century remain unsurpassed, and should perhaps be considered **the twin founders of modern thought**. We live in an age defined by its reaction to Spinoza and to all that he recorded in his philosophy. And there is no more compelling expression of this reaction than the philosophy Leibniz developed in the long years after his return from Holland (p16).

And see this quote from Madame Blavatsky, in her *The Secret Doctrine* (again, my **emphases**):

> It may be correctly stated that were Leibnitz' and Spinoza's systems reconciled, **the essence and Spirit of esoteric philosophy would be made to appear**. From the shock of the two—**as opposed to the Cartesian system**—emerge the truths of the Archaic doctrine.

In contrast to the above emphases on Spinoza and Leibniz as "the twin founders of modern thought," or as expressing "the essence and Spirit of esoteric philosophy," "as opposed to the Cartesian system," Rene Descartes is long considered by academia the father, and indeed the epitome, of philosophic modernism and Rationalism. Yet curiously, both Leibniz and Spinoza vehemently, rigorously and indeed brilliantly disagreed with Descartes at the most fundamental of levels, while at the same time forming systems which (as we will explore herein) are curiously resonant and unified in their anti-Cartesianism, as well as being foundationally allied

(again opposed to Cartesianism) with the key insight and operational axis of rational mathematics and the mathematical ratio, as we will soon see.

Rationalism is many things, but clearly it is not simply, fundamentally, or even mostly, Cartesian. Descartes, himself, was notoriously, and very problematically, a metaphysical dualist. This doesn't mean (at least not explicitly) that he fights metaphysical duals, as did Don Quixote, but that he believed in the existence of two, fundamentally distinct, substances (or roots of existence): Mind vs. Matter. The problem with this dualism remains: If there is no underlying or common causality (substance) between them, how do these two substances interact, say, when my mind decides to move my fingers around my keyboard in typing this sentence?

This is the historical incarnation in the West of the *exceedingly irrational* mind/body problem; the two-headed dragon-shaped windmill, which, to this day, can be seen lurking the halls of academia, only to be ritually drawn and slain quarterly by the ever-victorious professor of the History of Philosophy. And when Descartes, the arch-dragon of rationalism falls, with his dual snapping sets of metaphysical jaws, he drags down each of his two underlings—the lesser rationalists and henchmen—Spinoza the foundationalist[i] and "dedicated Cartesian,"[ii] and Leibniz, the fatal-optimist of infinite, fantastic opulence.

And so the "holy grail of philosophy"[iii] is yet again snatched away for another quest and another tenure, safely folded into the dark recesses of unconscious academic gamesmanship—tightly guarded by the rigid spines of countless rows of textbooks, all echoing the same glorious tale of victory over the dicephalous dragon of Rationalism, Descartes.

Clearly, at any rate, Descartes, the dragon of dualism, cannot be seen as a knight of nondualism, at least not on his own terms, and his system (though perhaps not his style of exposition) is, in the end, quite irrational, as most scholars would agree,[iv] so on these terms, he can't be considered a key, or representative, Rationalist.

As Stewart says:

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[i] A key interpretive error we will correct herein, with the help of Deleuze.

[ii] According to Ken Wilber's brief encounter with Spinozistic history.

[iii] See Mathew Stewart's *The Truth About Everything: An Irreverent History of Philosophy*.

[iv] This is not to be considered a definitive account of the fundamental irrationality of the Cartesian system. For that, consult virtually any modern professor of philosophy. And this is not to say that Descartes does not have his truths as well, but simply that they are compromised by irrationality of his metaphysics, and his desire to secure absolute certainty, at whatever cost.

> In the most widely accepted narratives of the history of thought, Descartes' so-called dualism is often taken to represent a fundamental revolution in ideas and the starting point of modern philosophy. In style and method Cartesian philosophy did indeed mark an important, hugely influential breakthrough in European letters; but in substance his work is perhaps better understood as an attempt to conserve the old truths in the face of new threats. His dualism was in essence an armistice of sorts between the established religion and the emerging science of his time. By isolating the mind from the physical world, the philosopher ensured that many of the central doctrines of orthodoxy—immortality of the soul, the freedom of the will, and, in general, the "special" status of humankind—were rendered immune to any possible contravention by scientific investigation of the physical world. Conversely, the complete self-sufficiency of the machine-like material world guaranteed that physical science could proceed without fear of contradiction from revealed religion. … For men such as Descartes, Malebranche, and Leibniz, solving the mind-body problem was vital to preserving the theological and political order inherited from the Middle Ages and, more generally, to protecting the human self-esteem in the face of an increasingly truculent universe. For Spinoza, it was a means of destroying that same order and discovering a new foundation for human worth.
>
> Spinoza's answer to the mind-body problem marks a radical break in the history of thought—the kind that happens only every millennium or two (p164).

What then is Cartesian in Nondual Rationalism given that Descartes' metaphysical dualism is so clearly and obviously irrational, or pre-rational and pre-modern? What specifically did Spinoza or Leibniz inherit, or even pass over, from Descartes, that we may find useful in outlining and expanding Nondual Rationalism? Many things, such as his focus on the direct interface of experience in the cogito—a key element and limit (relative boundary) of Nondual Rational Epistemology—and some general elements of his system of physics, such as the focus on vortices (spin) in the formation of the solar system (a spinning bit)—both of which will be explored in Volume II—but mainly what was emulated in Descartes was his geometric style of rigorous explication.

Descartes geometric style, while still being very readable and personable, was definitively rational. Both Spinoza and Leibniz admired and expanded on this style, and particularly the use of rigor and logic which Descartes inherited from earlier mathematical treatises, such as Euclid's *Elements*. Spinoza inherited and perfected this style to demolish Descartes' inherent irrationalism, the key tenets of dualism, to replace them with a fundamentally nondual metaphysical system wherein mind and body are mere attributes or ways of perceiving, conceiving and *expressing* "the essence of Substance," which is ultimately infinite and unbounded existence itself (in line with the existentialists, but opposed to academic accounts of Spinozism and Rationalism).

From the definition of *rationalism* in the online Britannica dictionary we find (my **emphases**):

> [Rationalism is a] Philosophical view that regards **reason** as the chief source and test of knowledge. Rationalism has long been **the rival of empiricism**, the doctrine that all knowledge of matters of fact ultimately derives from, and must be tested by, sense experience. As against this doctrine, rationalism holds **reason** to be a faculty that **can lay hold of truths beyond the reach of sense perception**, both in certainty and in generality. In stressing the existence of a **"natural light,"** rationalism also has been **the rival of systems claiming esoteric knowledge**, whether from mystical experience, revelation, or **intuition**, and has been **opposed to various irrationalisms that tend to stress the biological, the emotional or volitional, the unconscious, or the existential at the expense of the rational**.

From this definition we find many of the key aspects of the common (academic) understanding of rationalism: (1) an emphasis on reason, (2) the rival of empiricism or experience-ism, (3) the rival of esoteric knowledge, such as (chiefly) intuition, (4) opposed to *irrationalisms* that stress the biological, emotional, unconscious and existential. Let's examine these key aspects one by one and see if this category fits our key rationalists comfortably, or like a procrustean bed.

Nondual Rational-Empiricism and the Acategorical Imperative

Does rationalism—as embodied in the key rationalists Spinoza and Leibniz—stress reason and reject emotion? Most certainly both Spinoza's and Leibniz's systems can be seen as attempts to push reason to its absolute limits in (for Spinoza) the intellectual love of God, and for Leibniz, an understanding of God as an infinite system of monads (substances) based explicitly on principles of logic. But notice, even here, that Spinoza, while emphasizing reason, or the intellect, mixes it critically with the emotion of love. Indeed, he states that emotion can only be overcome, not with pure reason, but with higher (more reasonable) emotions, such as the intellectual *love* of God. There is no spurning of emotion in Spinoza, but rather a program for overcoming the state of passivity with respect to them.

Spinoza endorses not the rejection of emotion, but the active interfacing of emotion with its own higher forms. Spinoza recognizes that there is indeed a rationality inherent in all emotions. They are a rational outgrowth of evolutionary problem-solving;[i] serving a rational (if pre-cognitive)

[i] intelligent evolution, as it were…

purpose, with the *higher emotions* involved in the higher forms of cognition, such as reason and the intellect. In Spinoza, reason is never divorced from emotion. It does not conquer emotion, but rather emotion is harnessed to conquer itself and lead to more reasonable or rational kinds of emotions, like the intellectual love of God.

As Matthew Stewart says (and note here the specific nondual emphasis):

> The endpoint of Spinoza's philosophy—the intellectual love of God, or blessedness—transfigures all that precedes it. … It is the union of the individual and the cosmos, of freedom and necessity, of activity and passivity, of mind and body, of self-interest and charity, of virtue and knowledge, and of happiness and virtue (p177).

Does Spinoza or Leibniz reject or spurn experience, or stress reason *at the expense of* experience? Not so at all. Indeed, Spinoza was a great fan of scientific and empirical methodologies, and none of his rationalizations contradict, or occlude empirical data (and he would likely not allow them to, if he found out they did). Rather, they are born from it and help to organize it. Indeed, as Antonio Damasio has shown, Spinoza's psychology of the emotions has held up extremely well and even today can provide insights to neuroscientists, such as himself (see his book *Looking for Spinoza*). Spinoza's metaphysics, as well, was, and still is, attractive to many empirically centered scientists, such as Albert Einstein, who called himself a "disciple" of Spinoza.

Indeed, Spinoza can even be seen as a progenitor of empiricism for many reasons. Firstly, Spinoza's philosophy was directly influential to John Locke, as Locke purchased and studied all of Spinoza's work in depth, during his exile in Holland. Leibniz himself, as Matthew Stewart goes on to show, drew many parallels between Locke's empiricism and heretical Spinozism, such as Spinoza's rejection of the notion that the body was known empirically to the degree that we can say that the higher functions of cognition, such as consciousness, could not arise *with* it in its increasing complexity.

Spinoza asks, "What can a body do?" He says (my ***emphases***):

> Nobody as yet has learned from ***experience*** what the body can and cannot do ... solely from the laws of its nature insofar as it is considered corporeal. For nobody as yet knows [again, clearly from experience] the structure of the body so accurately as to explain all its functions, not to mention that in the animal world we find much that surpasses human sagacity, and the sleepwalkers do many things in their sleep that they would not dare when awake ... [the human body] surpasses in ingenuity all the constructions of human skill.

Can the complexity of a body *lead* to consciousness? Spinoza says, in effect, we simply do not have the empirical data to show that it can't, so there is no reason to suppose a dualistic Cartesian disconnect between mind and body. Rather, Spinoza says, mind and body are the different ways, or perspectives

(attributes),[i]* from which we can get to know the nature of reality, or the "essence of Substance." Leibniz (initiating a chain of Spinozistic misrepresentation) saw this very modern element in Spinoza's work—of emergence in the evolution of mind, essentially predicting the general truths of cognitive science and the gradient of animal intelligence, from amoeba to human being—as indicating a reductive materialism. This materialism only appears, however, when the polarity (nonduality) and parallelism of Spinoza's attributes are neglected or misunderstood, and we take only the outside, objective view, or the view from the attribute of Extension of Spinoza's immanence.[ii]*

Spinoza was indeed a direct progenitor to the line of intellectual descent we know as Empiricism. Stewart says:

> Leibniz's unstated intuition that Locke was something of a Spinozist, is probably more insightful than is generally allowed in modern interpretations of the great empiricist's work. … the parallels between his [Locke's] work and that of Spinoza extend well beyond those suggested by Leibniz. To be sure, as a conciliation-minded member of the Christian establishment, Locke toned down or obfuscated some of the more radical implications of his Spinozism—a task for which his inimitably wobbly prose was well suited (p268).

Essentially, Locke incorporated Spinoza's empirical elements, such as a focus on the empirical reality of the body, and on the senses and experience in the formation of the mind (as well as his rational notion of democracy), while abandoning his more radical and modern notions, such as the mortality of the body and individual human soul, the unity of determinism and free-will (commonly and incorrectly seen as the removal of the notion of free-will), all of which also greatly alarmed the pre-rational and pre-modern aspects in Leibniz.

Indeed, one of the radical elements in Spinoza's modernism was his use of empirical methodologies in scriptural analysis. In his *Theologico-Political Treatise*, Spinoza applies an empirical approach, stating that Nature herself should be approached empirically. It is from the empirical data, not based merely on reason, that we must draw our principles and definitions about the natural world, and therefore as well, about the relevance and meaning of the natural artifacts of man, such as the scriptures. Spinoza writes [my ***emphases***]:

> I hold that the method of interpreting Scripture is no different from the method of interpreting Nature, and is in fact in complete accord with it. For the method of interpreting Nature consists essentially in composing **a**

[i]* See, Spinoza's Attribute Polarity and "The Nucleation of Observability" (p486).

[ii]* See, Spinoza's Attribute Polarity and "The Nucleation of Observability" (p486).

> **detailed study of Nature from which**, as being the source of our assured data, **we can deduce the definitions of the things of Nature.**[i¥]

Matthew Stewart continues, noting the similarity between Spinoza's position and that of David Hume, who is generally considered by academia, the arch-empiricist. He begins with a quote from Spinoza himself [my ***emphases***]:

> "the human mind … has not an adequate but only a confused and fragmentary knowledge of itself, of its own body, and of external bodies." That is to say, in Spinoza's world, our knowledge of ourselves, just like our knowledge of particular things in general, is mediated through the body itself, and is therefore always imperfect or fallible and open to revision. Thus, minds are every bit as complex and multifarious as the bodies of which they are the ideas. (***It is worth noting that Spinoza's position is quite close to that which the historians of philosophy ascribe to the radical empiricists, such as David Hume, and not at all consistent with the "rationalism" with which he is often incorrectly identified)*** (p172).

Again we see the tight procrustean bed of academic/exoteric "rationalism" projecting its ill-fitting categorical boundaries into wounds on the sprawling esoteric body of Spinoza's philosophy, and again we invoke the ghost of Deleuze and Nagarjuna to implore the reader to pulverize the categories inherited from the past. Again we incant the acategorical imperative of nondualism and invite the reader to look outside the academic box of rationalism to explore Spinoza's philosophy anew; to see it beyond "rationalism" and even as a trans-rationalism, in this sense as beyond the common stifling restrictions of the term.

As I will show in the chapter on the symbiogenesis of subject and object[ii]* and in the section *The Symbiogenesis of the Rational and Empirical*, this intimate connection between rationalism and empiricism is emergent in the very process of the development of consciousness as a function of what we will call the "mnemonic primitives," wherein the brain, and its rational (or irrational) concepts cannot even begin to grow (and cannot continue to exist) without external sensory stimulation. There is a direct coupling between percept and concept—between experience and rationalization—encoded at all levels, from the most primitive rudiments of 'mental' evolution and individual development at the level of cellular 'sensation' and reflexive 'intelligence,' to the highest degrees of the human perceptual faculties and cogitations.

Stewart writes:

> In the histories of philosophy, since the days of Immanuel Kant (including my own, incidentally), Spinoza is typically classified as a "rationalist"…

[i¥] TTP, chap. 7, G III.98/S 87

[ii]* See Emergence, Mnemonic Primitives, and the Symbiogenesis of Subject and Object, p528.

> Along with a number of other recent commentators (see Mason, for example), I now find this label to be worse than useless; Spinoza was, if anything, closer to the positions of radical empiricism (p327).

For this reason, and following in both the nondual and the esoteric rationalist traditions, we conceive of rationalism not at all in opposition to empiricism, but in a critical symbiogenesis with it. Thus Nondual Rationalism can just as rightly be called nondual rational-empiricism, when the emphasis is dully placed. In this volume, the focus is largely placed on fleshing out the buried tools of the rationalists, but the roots and extensions of nondual rational-empiricism will be explored to much greater depth and height in volume II.

The Nondual Rational as Trans-"Rational"

Stewart goes on to call Spinoza's philosophy a radical break and opposition to the bulk of philosophy up to that point; a rebellion against the received Platonic doctrine that the mind is a "special kind of thing, endowed with free will and immortality, whose possession grants humankind an exemption from the order of nature" (p170). This essentialism is "the creed that Spinoza sets out to destroy," like Nagarjuna before him, and Deleuze after him, with an unspoken acategorical imperative. "In fact," says Stewart, "Spinoza's philosophy, if true, ***pulverizes*** not just the theories of his philosophical predecessors, but also many of the religious doctrines they sought to protect…. (my ***emphases***)" Indeed, both Descartes and Leibniz—at least on the public/exoteric surface—fall in this latter category, as rationalists holding on to their exoteric pre-rationalism for mutual protection of both the existing pre-rational establishment and the blossoming rational.

Spinoza, whom Stewart clearly sees as the first "modern" philosopher"—a father to both "rationalism" and "empiricism," while being beyond the modern academic categories of "the rationalist" and "the empiricist,"—essentially predicted the fields of rational democracy, evolution through natural causes without the need for a designer, and cognitive- and neuro-sciences, (this last point is also shared by the noted modern cognitive-scientist, Antonio Damasio, in his *Looking for Spinoza*). In this sense, Spinoza's philosophy, which we are taking as foundational to Nondual Rationalism, is actually a trans-rationalism at its highest and deepest, most fundamental points—many of which will be expanded herein.

So we have seen that Spinoza is not against the emotions, he does not consider them irrational and does not seek to supplant them with pure reason. He also does not spurn the faculties of experience, which he calls the "first kind of knowledge." In fact experience is critical to inform rationality, in Spinoza. But what about intuition? Indeed, Spinoza's view can hardly be seen as against intuition when he considers intuition the *highest* form of

understanding, the bleeding edge of the intellect. It is intuition, or "the third kind of knowledge," that enables us to know God in the way that affords us with "the intellectual *love* of God." So we see that the circle is completed with the recognition that *intuition* is the highest form of knowledge which allows the *emotions* to elevate us to the *intellectual* love of God.

The Exoteric Face of Esoteric Rationalism

But what about Leibniz? Was he as trans-"rational" as Spinoza? Matthew Stewart shows in great detail, which we will explore later on, that Leibniz was essentially, and covertly, a Spinozist, and his philosophy consists of an elaborate attempt to overcome his own Spinozism.[i] Leibniz demonstrates in his own notebooks that his goal is to disguise and subvert his own Spinozism so as to make it palatable to the public, in order to create a new and unified Theology and Theocracy, or "city of God," as opposed to Spinoza's fully rational dream of a democratic state where the *individual* is sovereign and the state serves the purposes of individual freedom.

For example, following a debriefing by Tschirnhaus (a mutual friend of both Spinoza and Leibniz) on Spinoza's "secret philosophy" found in his *Ethics*, blatant Spinozisms creep into in Leibniz's notes, denoting, for instance, that God and "Nature" are One.[ii] But later on, Leibniz suddenly recants his unwitting advance, or "collapse," into Spinozism (Nondual Rationalism and modernism) saying [my notes and ***emphases***]: "God is not something metaphysical, imaginary, incapable of thought, will, or action, as some represent him [not that Spinoza actually represented God as imaginary, or incapable of thought or action, as Leibniz consistently represents Spinoza's views], so that it would be the same if you were to say that God is nature, fate, fortune, necessity, the World. Rather, God is a certain substance, ***a person***, a mind." Leibniz then sets himself the task, "It must be shown that God is a person, i.e., an intelligent substance."[iii¥] "Behind the 'It must be shown,'" Stewart interjects, "lies a characteristically Leibnizian anxiety—an unspoken 'or else.'… Or else what? What if he should fail to prove that God is a person and not 'something metaphysical'? (p184)"

Stewart continues, a few pages later, "In his notes from April, Leibniz once again rebels against Spinoza's teachings. 'Is the mind the idea of the body?' he asks himself, clearly referring to Spinoza's doctrine. 'That cannot be.' If the mind is the idea of the body, he reasons, then it must perish with the body; and this contradicts the doctrine of personal immortality (p186)."

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[i] This is a simplistic view of the matter, of course, and the full picture of Leibniz's Spinozism will be explored here: Leibniz: A Reactionary Chiaroscuro, p668.

[ii] And contrary to modern assumptions, Spinoza's "Nature" is not merely the physical or material world, but the whole of Reality.

[iii¥] Leibniz: A VI.iii.518; DSR, p. 26.

The doctrine of *personal* immortality, you will note, is to ascribe an absolute quality or *essence*—that of eternity—to a form, a relative being. This reaction against Spinoza, is a return to a classically essentialist, pre-rational, Platonic notion, that the human being has an *individual* pre-given and eternal essence, a *personal* soul, that is free from the relative world of time, and its dependent arisings. Leibniz's anti-Spinozism is essentially anti-Nagarjunan and anti-Deleuzian, in this pre-rational demand—a demand that will launch spectacularly bizarre ramifications echoing throughout his monadology.

On a ferry, in his journey to his first and only face-to-face meeting with Spinoza, Leibniz pens a draft of an argument that he would soon make directly to Spinoza. In this argument, titled 'That a Most Perfect Being Exists,' Leibniz proves, through his own Principle of Sufficient Reason, that Spinoza's God is possible and indeed logically and rationally necessary, indeed unavoidable, given this core principle of Leibniz's entire philosophy (p191).

In the argument, Leibniz "duplicates in abbreviated fashion the first crucial propositions in Spinoza's *Ethics*: Substances are radically distinct and can be understood one without another; but all things in the world are understood through the unique and ultimate reason for all things; therefore, there cannot be two or more substances in the world; therefore, there is only one substance, and all things are modes of this one substance" (p192). Thus Leibniz begins with his "irrevocable commitment to the Principle of Sufficient Reason—that for every thing there must be a reason—and ends in a declaration of belief in the core doctrines of Spinoza" (p192). Leibniz then makes a *clearly* deliberate false attribution of the argument to "Plato in the *Parmenides*"[i¥] rather than to the obvious owner, "Spinoza in the *Ethics*."

Stewart goes on (my ***emphases)***:

> Nor can there be any doubt that Leibniz knew in what direction he was heading. In his notes from the meeting with Tschirnhaus in February, he attributes to Spinoza the claims that "God alone is substance … and all creatures are nothing but modes." Even more telling is a note Leibniz made to himself on one of the letters to Oldenburg that he picked up in London. Where Spinoza says, "All things are in God and move in God," Leibniz writes: "One could say: all things are one, all things are in God in the same way that an effect is contained within its cause and properties of a subject are in the essence of the same subject." Leibniz here implicitly acknowledges that his own speculations—notably, his repeated suggestion that the things of the world are to God what properties are to

[i¥] A VI.iii.573.

> an essence—are elaborations of the central doctrine of Spinoza's philosophy.
>
> "An attribute is a predicate which is conceived through itself." Leibniz continues in his shipboard draft. (Spinoza himself says: "Each attribute … must be conceived through itself.") "An essence is…" Suddenly, the manuscript breaks off in midword, midsentence: *Essentia est pr…*
>
> Something throws Leibniz off; his quill quivers; he stops to think about what he is doing. He retreats from philosophy to the "philosophy of philosophy." ***His next lines are perhaps the most revealing he ever committed to paper:***
>
> > *A metaphysics should be written with accurate definitions and demonstrations.* ***But nothing should be demonstrated in it apart from that which does not clash too much with received opinions.*** *For in that way this metaphysics can be accepted; and once it has been approved then, if people examine it more deeply later, they themselves will draw the necessary consequences. Besides this, one can, as a separate undertaking, show these people later the way of reasoning about these things. In this metaphysics, it will be useful for there to be added here and there the authoritative utterances of great men, who have reasoned in a similar way. …*
>
> At this point, Leibniz was a Spinozist and he knew it. His strategy would be to conceal his true views wherever they offended the orthodox, to cite great men such as Plato and Parmenides as a diversion, and, in general, to work for the day when Spinozism might emerge out from under the false accusations of heresy and claim its rightful place in the sun. In the meantime…Leibniz would censor himself…of…thoughts that the world was not ready to receive (p193-4).

Because Leibniz is operating on rather veiled and exoteric motives—as should be clear, even from this brief section of Stewart's masterful historical work—it is difficult to know what he *really* believed and what he merely argued. As a courtier and barrister, Leibniz was constantly arguing things that he clearly did not, could not an need not hold true. This was his job. Even if he *did* believe his publicly stated, and often quite irrational, philosophy—contrary to his admission that "nothing should be demonstrated in it apart from that which does not clash too much with received opinions"—it is clear, as we shall see, that Leibniz possesses a deep sense of rationality, while at the same time clinging to elements of pre-rationality, such as the transcendent humanoid God of the pre-rational Catholic and Protestant churches, the immortal (Platonic essentialist) human soul and absolute human freedom of the will—all of which are strictly ***in****dependent* arisings (e.g. "windowless monads"). Indeed, it is Leibniz's attempt at rationalization of these profoundly pre-rational, and dualistic/essentialist ideas that gives his system such profound tension, or "chiaroscuro" as Deleuze called it, endowing it with all the fascinating,

fantastic and "Baroque" embellishments, arabesques, lacunae and irrationalities that this imposes on his covertly-Spinozist system.[i]*

For now, then, and until we get to the section wherein we draw out the identity of opposites between them, we can think of Leibniz as essentially a covert-Spinozist in self-reflexion and reaction, and hence a covert trans-"rationalist," with a bizarre mix of pre-rationalisms and irrationalisms thrown in the mix, for good exoteric measure—though this is not to underestimate the beauty of his logical insights and monadology formed in reaction to his own Spinozism.

[i]* See, Leibnoza Von Spinbitz: An Identity of Opposites, p659.

THE "LABYRINTH OF THE CONTINUUM" AND THE PRINCIPLE OF NONDUAL RATIONALISM

> *Deep, deep infinity! Rest, dreaming removed from the nervous tensions of daily life; sailing over a calm sea, on the bow of a ship, toward a horizon that always recedes; staring at the waves that go by and listening to their monotonous, soft murmuring; dreaming away toward unconsciousness.* — M.C. Escher, *Approaches to Infinity*

This work presents a new view of Rationalism that integrates the key philosophical and mathematical insights of the rationalists. These include; mathematical rationalism and the basic properties of rational numbers, Leibniz's calculus as the mathematical aspect of his infinite monadology, Spinoza's Triune Infinite,[i]* and Deleuze's Spinozistic notion of univocity, as the operational framework for his trans-foundational metaphysics. These key insights will unfold within a nondual framework implicit in the ideas of the rationalists themselves, as we have already started to see.

A key aspect of Nondual Rationalism, as discussed above, is the Nagarjunan polarity of Emptiness and Form, as well as the notion of the identity of opposites.[ii] How can we understand this polarity of Emptiness and Form in a convergent understanding of mathematical and philosophical rationalism? And what is the identity of opposites in this context?

In nondual mathematical rationalism (Interface Mathematics), the polarity of Emptiness and Form, or absolute and relative, can be translated rather simply as the polarity of infinity and number.[iii]* 'Infinity,' in this sense is taken from the ancient Greek *apeiron* as boundlessness, which "derives from the archaic a-peirar … a rope, knot or bond, i.e., something that has to be put around or upon something else from the outside, not just an

[i]* See Spinoza's famous letter on the infinite.

[ii] It may be objected outright that the nondual is fundamentally ineffable and hence, "The tao that can be told is not the eternal Tao." The Tao that is spoken and described throughout this work is the Tao as it manifests only in the relative world (the relative scope). This framework of Nondual Rationalism actually makes the statement, and holds open the space, that the absolute, which includes all forms of boundlessness such as the boundless time of "eternity," is indeed ineffable precisely because it is not relative and relational, but its identical opposite.

[iii]* See The Polarity of Infinity and (Primitive) Number, p250.

end or a limit which is intrinsic to it."[i¥] In Interface Mathematics and Nondual Rationalism, then, infinity as *apeiron* or absolute openness is in polar or identical opposition to 'number' as the most abstract and general concept of closure or relative boundary available to the forces of representation. This "bounded infinite" within number, as we will see, is the primitive encapsulated "infinite number," enfolded within all number and only broken into operation with the invention of the mathematical ratio.

In order to integrate all aspects of rationalism (e.g. philosophical and mathematical) this infinity, boundlessness or Emptiness within number must correlate with the infinity opened up in the mathematical ratio, which is the core of the mathematical definition of the Rational numbers and of mathematical rationalism. But more pointedly, it must explain the meaning of (or define) the "undefined" ratio with zero in the denominator, such as 1/0. Indeed, a key question which we will answer in much more detail later is, "What is this *limit on definability* for the rational numbers?" Or, "Why, exactly, does placing a zero in the denominator produce these 'undefined' results?" And, "Is a *limit on definability* not in essence a limit on limits themselves, and hence merely the *unlimited* and Infinite once the double-negative has cancelled out?"

Let us not get bogged down in complex and premature questions, but instead come back to the more simple and general question directly at hand; "What is it about the infinity, Emptiness and boundlessness opened up with the Rational numbers that can provide us with the 'essence' of Nondual Rationalism, both mathematical and philosophical, which can then serve, in the form of a simple principle, as our Ariadne's thread through this *labyrinth of the continuum*, and through the history of rationalism itself?" The answer is rather simple once it is visualized and held intuitively in the mind as a whole, but we must traverse a bit of basic mathematical abstraction to get there.

Note that all of this will be expanded in much greater detail in the section, on Interface Mathematics. We will explore just enough basic mathematics here to give us a thread for tracing the essence of Nondual Rationalism as we proceed through this labyrinth. Note also, that the level of mathematics explored herein, while meta-mathematically, or philosophically advanced, covers mainly the basics, or fundamentals of mathematics itself, though we do get into the philosophy of the calculus and Set Theory, later on. So from a mathematical point of view, this is largely elementary stuff; addition, subtraction, fractions, etc. Philosophically and meta-mathematically, however, it breaks open into a new way of understanding and organizing these fundamentals in resonance with nondual-rational and

[i¥] (Verelst, Zeno's Paradoxes. A Cardinal Problem: I. On Zenonian Plurality)

trans-rational Interface Philosophy and Mathematics, helping to provide a fundamental and much needed cohesion between physics and mathematics.

An integer (in "integer space") can be seen as a "numerical identity," an absolute numerical category separated from the next integer by an unbridgeable gap, a numerical vacuum, so to speak. The rational numbers, on the other hand, are a function of a higher-level *relation* between two integers. The mathematical ratio is a division between two values or magnitudes, e.g. one divided by two, or 1/2. The slanted dividing line in this fractional notation is called the "solidus," while the horizontal line used in the vertical notation, $\frac{1}{2}$, is called the vinculum, and we will use them both herein interchangeably to denote the conceptual dividing interface itself, regardless of notation.

This rational division, or ratio across the solidus or vinculum opens up the space between the integers allowing the Rational numbers to possess any value between those of the integers. For example, 4/3 is one third of the way between 1 and 2, and 10/3 is one third greater than three, while 908/300 is between 3 and 4, but a mere 8/300ths more than 3, which, from our frame of reference, might very well be entirely negligible.

The Rational numbers, in fact, ultimately trace out a *continuity* in the number-line[i] with the characteristic that between any two of the *infinite* integers, "an infinity" of Rational numbers can be found. Leibniz famously calls this quality of the continuum opened up by the rational numbers, the "the labyrinth of the continuum." This is because, contrary to Euclid, it is impossible to form a continuous line from an infinity of extensionless points, because, in any infinite number of points, between any two, there is yet an infinity of other points that would need to be added. In the continuum, there is a mind-boggling and labyrinthine "infinity of infinities" *within* the infinite integer number-line itself, and even *within any number-line interval* whatsoever. But when we think of infinity as simply boundlessness, or

[i] It is now known that the Rational numbers in themselves do not *completely* compose the continuum of "the real numbers", because of the existence of irrational and transcendental numbers, or "Dedekind cuts" in the rational continuum. But it is the "violation of the closure property," in the inversion of the input-output polarity (See Recursion, Iopol, Violation of Closure and the Acategorical Imperative, p329), initiated in the mathematical ratio that first makes contact with the continuum and *opens* the higher level functions of number to this immanent infinity of the "immanent-transcendent axis," which the "trans-rational" numbers enfold into. We will see, however, that because Dedekind's cuts are "infinitely thin", the continuity of the Rationals is not broken, but rather simply not complete. If this seems a conundrum, it will make sense later, for example, once the concept of an aspect infinity is understood (See The Triune Infinite: Interfacing Emptiness, p268).

apeiron, rather than an object, this infinity of infinity is simply a common-sense aspect of deep-level boundlessness.

This infinity *within*, or *immanent to*, the number-line at any interval—which is opened up by the mathematical ratio of the rational numbers[i]—is the source of Zeno's famous paradoxes of the infinite.[ii] This *infinity within*, this indwelling or *immanent* infinite—in opposition to the *transitive* right-left, up-down, positive-negative, etc, etc, infinities of the integer number-line—is also central to Nondual Rationalism. But we must find our way, step by step, to a more comprehensive view of this central, and indeed ever-present, "point" in the labyrinth.

Think of the two numbers or magnitudes of the ratio relating across a vinculum as two kids playing on a seesaw, their weights inter-relating across the fulcrum in the middle. If both weigh the same, or are the same weight-value, there is a balance, and we have unity, however we may choose to represent it:

$$1 = \frac{1632}{1632} = \frac{\&*\%@\$!!!}{\&*\%@\$!!!} = \frac{1}{1} = 1|1$$

Beyond the sequential differences between divisor and dividend, or input and output, there is a perfect symmetry to the ratio, both quantitatively and qualitatively, in both form and function, between the bottom and top numbers, (or the immanent and transcendent directionalities as we are calling them herein),[iii] just as there is a symmetry between the right and left sides of the seesaw. It doesn't matter who is on what side, or in which direction the seesaw is facing. If the two sides weigh the same, there is balance and unity, and if one side weighs more, then the other side weighs *relatively* less, and vice versa. The Rational numbers are fundamentally a function of relation; the ratio.

This perfect symmetry and polarity between the immanent and transcendent aspects of the ratio often goes unnoticed and neglected. In fact

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[i] This is the "violation of the closure property," which we will explore in much greater detail later.

[ii] We will discuss Zeno's paradoxes in much greater detail later throughout the book, but specifically in the section on the paradoxes of the infinite. See, Part Two: Interface Mathematics, p200.

[iii] Note that we could call the transcendent direction "ascendant", in order to ward off the possible confusion with the transcendental numbers, which are certainly not to be confused with the rational. But immanence and transcendence are key to the main axis of the framework of Nondual Rationalism, as we will see, and they are key to the meaning of the mathematical ratio. We will reserve the term "ascendance" for additive increases, while the multiplicative *transcends and includes* addition through its recursivity. This will be discussed in greater detail in the section on, Part Two: Interface Mathematics, p200.

this neglect is encoded into the very language of mathematics and in the direction of operation in division; from top to bottom, or numerator to denominator.[i] Indeed, in line with a central theme in the *Tao Te Ching*,[ii] we will find this as part of an overarching "transcendent-bias," (or a "yang-bias") operating throughout mathematics, philosophy and science—but the recognition of this hidden balance is key to unlocking the core of Nondual Rationalism.

Let's take this see-saw analogy further to see the transcendent bias more clearly. Imagine that the kid on the right side of the see-saw (denominator) had his mouth taped shut, while the kid on the left side (numerator) were arbitrarily given the right to scream out his joy or disappointment depending on his state of elevation in the relation. If he goes up above his variably-weighted friend, then he screams in glee, "Positively fantastic! I'm greater than one!," while his friend is forced to experience his disappointment in silence. We, on the outside of the fenced-in playground, hear the value of the see-saw in general elevated above unity, at the expense of what we cannot hear, the other kid, stuck dumb-rendered and unhappy on the ground.

The bias inherent in the Rational numbers or fractions is controlled by the active *frame of reference*,[iii] and this is placed in the top or *transcendent* position of the numerator. The advent of the function of the ratio opened up the denominator, the immanent position, to allow it's new functionality, and now, in this new rational number-space, intrinsic to every integer is a denominator of unity, dividing every integer by the original categorical quantum of mathematics, the number *one*.

From the active frame of reference of the numerator and its increasing (ascending and transcending) integer values, an increase in value of the top number directly increases the *transcendent value* of the rational number itself, more and more until we "reach" the unreachable infinite. The active frame of reference is the aspect of the ratio that is in control of *numeration* and *value*. Conversely, because the ratio, like the see-saw, is a reciprocal, symmetrical and inversely balanced (polar and nondual) relationship, an increase in value of the bottom number decreases the *transcendent value* in the same ratio until you reach the unreachable *immanent* infinity (apeiron) opened up, exclusively, in this very function of the rational number.

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[i] This is the input/output polarity (iopol), we will explore in Interface Mathematics.

[ii] Tao Te Ching, verse 42, by Lao-tzu, from a translation by S. Mitchell, states: "All things have their backs to the female and stand facing the male. When male and female combine, all things achieve harmony."

[iii] Note that while the transcendent number (numerator) may hold the active or default frame of reference, the immanent number (denominator) is the active divisor to the divided, or dividend of the numerator.

Numbers began their evolution at *one* and transcended or ascended into higher and higher values. Counting was their purpose, their "fitness function," and reason for coming to be. The Rational numbers came later, transcending-and-including the integers, as a function of the relation between two of them, but fundamentally operating on a new "axis;" immanence vs. transcendence. The ascending-transcending bias [i] is therefore a natural and pervasive feature of the number-system in general, as the number-system is indeed a transcending-and-including holarchy [a hierarchy of holons, or wholes that are always parts of higher level wholes, and so on] of functions built on other functions, ultimately built on numerical identities serving the very human function of labeling and inventorying *increasing* agglomerations of *real* objects. This is the transcendent-bias in stark relief.

$$\frac{transcendent}{immanent} = \frac{active}{passive} = transcendent - bias$$

and…

$$\frac{increase}{decrease} = increase = transcendent - bias$$

not…

$$\frac{decrease}{increase} = increase = immanent - bias$$

Transcending and including (recognizing and accounting for) this transcendent-bias, to get to the nonduality and neutrality, the open ground of rationalism, this must be seen as a true polarity, and the qualitative differences between the values that seem so absolute through the active frame of reference of the transcendent numerator, must be seen, in a sense, as relative to the active frame of reference of the inherited interpretation. In other words, the differences in quality between immanent and transcendent positions are a function of the active frame of reference and order of operations of division. The numerator's frame of reference is active as the

[i] We'll see this as the "trans-trans-bias," where ascendancy equates to the transitive, and the transitive/transcendent mapping will be explicitly demonstrated through graphing basic functions.

determinant of value, and the denominator's is passive as the context for its meaning.

This transcendent-bias in operation in mathematics—and human thought in general (as we will see)—manifests in our tendency to see infinitely increasing values as normal Infinity, and infinitely decreasing values as undefined or approaching an *actual* limit at zero, as is the case with the errors of interpretation surrounding Zeno's paradox and the infinitesimal of the calculus.[i]* This immanent infinity, however, is the inverse pole of the infinite axis specific and unique to the rational numbers,[ii] and critical to Nondual Rationalism. And similarly, opening up the meta-mathematical understanding of this polarity to its true relative and reciprocal nature, is the key to understanding the thread of rationalism as it winds its way through the labyrinth of history.

To approach this thread more clearly, let's see what happens when the value in the denominator dips below the unit-value of the integers, the fundamental categorical numerical-identity 1, without reaching or crossing zero. Let us do this through the rational process of division, recursively dividing the immanent value by 5:

$$\frac{1}{1} = 1,\ \frac{1}{0.2} = 5,\ \frac{1}{0.04} = 25,\ \frac{1}{0.008} = 125,\ \ldots$$

$$\frac{1}{0.00000000\ 4096} = 244140625\_\ ,\ \ldots\ |\ \ldots\ \frac{1}{0} = undefined\ \_\ .$$

The value of the whole ratio, or the rational number, begins in balance, at 1, and (as the voice of the screaming kid reveals his glee at being lifted into the air) increases to 5, 25, 125, and … 244140625. The *increase* in overall value continues *toward* infinity to the point that when, and only when, we finally get tired of making distinctions that are too small to be relatively meaningful and we then reach over the infinite abyss …|… and *artificially* plug in 0 (because *we can't reach 0 through division*), the equation becomes undefined.

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[i]* See, Part Two: Interface Mathematics, p200

[ii] Specifically, in the violation of the "closure property" which we will discuss in great detail in Interface Mathematics

Why, when we increase toward infinity (apeiron) as we indefinitely "approach" zero through division of the denominator, do we not actually "reach" infinity when we finally skip the immanent infinity, represented here in decimals, and plug in zero? Were we increasing toward the *undefined* all along, while we thought we were increasing toward infinity? Is infinity itself then *really* the undefined? (But we are getting way too far ahead with this question, so let's drop back a few bridges.)

What then is the significance of the zero in the rational denominator if, just as the infinity in the numerator can't be reached through multiplication, the zero in the denominator can't be reached through the rational process of division? What is the significance of the fact that the rational immanent zero returns an "undefined," hence indefinite, and non-finite number, as does the infinity in the numerator? Are these inverted similarities merely coincidental?

In line with our earlier recognition, beyond the transcendent bias, that the transcendent and immanent operations (the numerator and denominator, respectively) are directly inverse and reciprocal in their power relations, we can see that a decrease in the value of the bottom number should be the inverse-identical (identity of opposites) of the increase in the value of the top number, and the "limit" at zero *should be infinity*, not merely the *undefined*.

Zero, then, in the denominator (as is generally recognized already by mathematicians and philosophers of mathematics alike) is the rational equivalent of infinity in the numerator, just as a crane pulling up the left side of the seesaw will achieve the same effect as a fat man sitting on the right; the very same side will "touch" the (untouchable) ground of infinity (apeiron),[i] no matter the mechanism. It is the simple inversion in this "relation of powers"[ii] across the solidus-fulcrum (*from which we have a preferred transcendent point of view*)—and the fact that we have as yet not operationalized the intrinsic infinite axis upon which the Rational numbers operate—that hides this rather obvious fact from us and from being explicitly operationalized in mathematics.

This immanent infinity, denoted in the rational denominator by zero, is simply unexpected from the default transcendent and transitive frame of reference of the Integer or Natural number-line, with its inherited notion of zero as merely an empty integer. And so this inverse rational infinity goes by the name of *undefined* rather than *infinity*.

This reciprocity of the Rationals is the source of R. Buckminster Fuller's statement, "multiplication through division." This is what is taking place when we divide the divisor. We multiply. But just as it makes no sense to

[i] To illustrate the inherent finity in this analogy for the "groundless" infinite.

[ii] As Hegel claims is the essence of the calculus, which we will come to in the section on the calculus.

divide any number by zero, it also makes no sense to multiply a number by infinity. Infinity (apeiron) can't be reached or multiplied by, finitized or defined, regardless of the position of the boundlessness across the solidus, and regardless where it occurs in the reciprocity of this polar relation of powers, whether immanent or transcendent.

The infinity and "essence" of Nondual Rationalism must then *be*, at least in part, this infinite divisibility that exists between and within all integer unit-values, hidden by the cipher and dividing toward ever smaller and smaller quantities indefinitely and unboundedly. On this immanent axis, of the Rationals, there is no final level of value; no final numerical form to reduce Emptiness to, or vice versa, and no reachable limit at immanent zero. Hence immanent, rational, "undefined" zero is actually unlimited, unbounded and infinite Emptiness. This infinite divisibility, infinite depth or immanent infinity, is the unbounded Emptiness of mathematical rationalism which we will take as a key property and root operational axis (positive infinity) of Nondual Rationalism itself, both mathematical and philosophical. And indeed, this unboundedness in the rational zero is encoded in Nagarjuna's definition of Emptiness.

From the Internet Encyclopedia of Philosophy, we find [my ***emphases***]:

> Nagarjuna saw in the concept *sunya*, a concept which connoted in the early Pali Buddhist literature the lack of a stable, inherent existence in persons, but which since the third century BCE had also denoted the newly formulated number "***zero***," the interpretive key to the heart of Buddhist teaching, and the undoing of all the metaphysical schools of philosophy which were at the time flourishing around him. Indeed, Nagarjuna's philosophy can be seen as ***an attempt to deconstruct all systems of thought which analyzed the world in terms of fixed substances and essences***. Things in fact lack essence, according to Nagarjuna, they have no fixed nature, and indeed it is only because of this lack of essential, immutable being that change is possible, that one thing can transform into another. Each thing can only have its existence through its lack (*sunyata*) of inherent, eternal essence. With this new concept of "emptiness," "voidness," "lack" of essence, "zeroness," this somewhat unlikely prodigy was to help mold the vocabulary and character of Buddhist thought forever.

Unlike the Natural numbers or the integers, the Rational numbers are composed in a function of relation—a polarity of *two* numbers, each playing on the other defining the value in a global symbiosis for the rational number itself—and hence they possess ***no intrinsic immutable essence or numerical identity of their own***. The integers, on the other hand, are categorically "closed," self-defined, numerical identities, in a sense; they have a unit "closure property" that is "violated" and pulverized in the function of division itself. Each integer can only mean one thing and have one identity separated from all others and categorically identical to any

integers of the same value. The Rationals, however, can be formed in an infinite number of ratios. The number 2, for example, can be written as 2/1, 4/2, 16/8 or 3446/1723, and it is "infinitely close"[i] to its "nearest neighbor," which naturally cannot even be defined, because it has no nearest neighbor, but infinitely many of them. Indeed, the relationship itself, is endlessly mutable, forming a continuum of possible states in between. (See Figure 1, below)

[i] To invoke the labyrinth before an explanation is at hand.

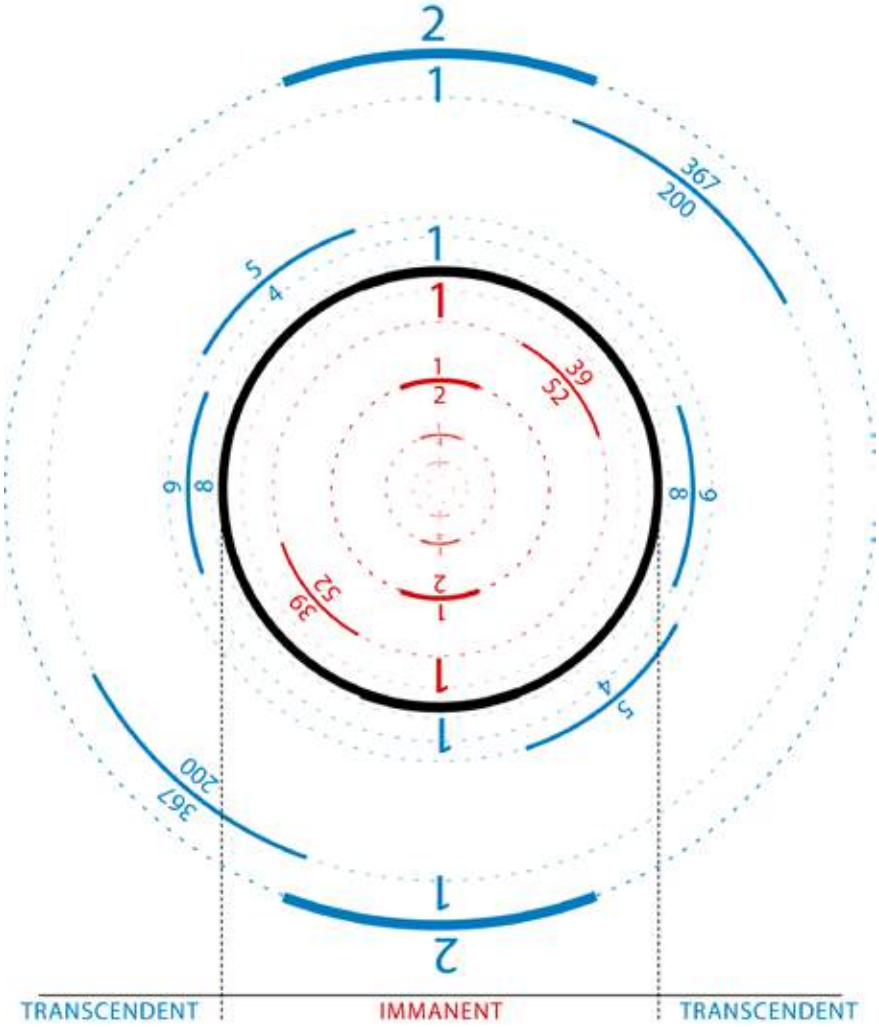

Figure 1: The Holonic Solidus:
This diagram illustrates the new axis of the Rational numbers as extending infinitely toward, but never reaching "immanent zero" or the zero of the rational, newly defined as an immanent infinity, once the operational axis of the Rational numbers is acknowledged. Notice specifically that the Rational numbers have no intrinsic negativity. From its two poles at 0 and infinity, all Rational numbers are intrinsically positive, or "intensive" in correlation with Deleuze's positive infinity of the rational. The negativity that some Rational numbers possess comes from transcending-and-including their transitive elements. This is why it makes no difference which side of the solidus the negative number is on, in order for the rational number to be negative. The negativity of the transitive numbers is transcended-and-included within the rational numbers.

So we can see here a precise break between the infinity of Rationalism and that of pre-rationalism. The pre-rational (transitive or regressive) infinity passes from one side of infinity to the other, right through the integer-zero as merely the absence of another self-defined integer on its way from the positive to the negative transitive values. In contradistinction to this positive/negative opposition, the mathematical ratio, of itself, can't even produce negative numbers, but rather merely an infinity of positive *intensities* on either side of "unity" (one), approaching, but never reaching immanent zero or transcendent infinity. The Rationals are operating on a new axis,[i]* and this is why the pre-rational (transitive) axis of infinity does not know what to do with this new role for the cipher as an immanent infinity once the mathematical ratio introduces the "violation" or "pulverization" of the "closure property" of the fundamental unit underlying the pre-rational integers.

Mathematical ratios, and hence rational numbers, have no intrinsically negative values. Try as we might, but they can't be reached by either multiplication or division.[ii]* And hence the "negative infinity" of the Rationals (to entertain the transcendent-bias further) is in the *immanent* direction, and **on the *positive* side of the integer-axis**, ever toward the "unlimit" of zero.[iii] The rational zero as infinity, then, will remain *undefined* until the transcendent bias is lifted and we can explicitly and operationally see the infinite axis, and indeed the infinite interminable pole "terminating" at the immanent zero, the inward pole of the positive infinity of the Rationals.

The idea that negative numbers and the negative infinity—as well as the positive and negative transcendent polarity itself (toward *increasing* positive or negative values on either side of the infinite integer number-line)—are in this sense pre-rational, is further supported by the observation that the ratio is indifferent to the placement of the pre-rational negative sign. You can put it in the numerator or the denominator or on the rational number as a whole and you get the same negative rational number. The negative infinity of the integers, which would *oppose* the positive infinity found in both of them, is simply *not* the negative infinity of the Rationals. It is this infinite divisibility and depth, this positive *immanent infinity* between the integer-unit *one* and its non-limit at the rational (infinite) *zero*, that fills the role of the "negative" on the immanent axis (which as a whole is positive,

[i]* See, The Orthogonality of Inverses and the Offset Origin-Identities, p338.

[ii]* See, The Kernel of the Trans-Trans Asymmetry and Instability at the Crossroads of the Transitive and I/T Axes, p340.

[iii] The rational numbers, then, are intrinsically "intensive," as Deleuze speaks of the "forces" of the sub-representational. Rational numbers, as we will see, are the mathematical equivalent of the forces of immanence and sub-representation.

or *intensive*), and in turn gives a new, unexpected and as-yet-unaccepted role to the cipher itself, as we will see.[i]*

And now we close upon our Ariadne's thread, the central principle of Nondual Rationalism that will guide us, and indeed pull us, through the rest of the labyrinth as it gets clearer and clearer what this thread really consists of and the forms, strands or chords it morphs or resonates into, pulling them, as well, from the deep-infinity of Emptiness. Indeed, this will be merely one strand of what will become an "Ariadne's Cable," getting stronger and stronger as it ties Nondual Rationalism directly to the senses and hence to sensibility and the roots of understanding.

Clearly the generalized (*a posteriori*) "essence" of Nondual Rationalism must open to continuity. It must have something to do with the infinite intensive axis intrinsic to the Rational numbers and to rationality itself. It must enfold the infinite divisibility and depth between or within any unit-value or interval and hidden behind the new as-yet-undefined role of the rational cipher. It must include the essence of Leibniz's labyrinth of the continuum and transcend the negative infinity of the pre-rational number-line. And yet, from the nondual traditions we know that this can't be the totality of it. It can't be *merely* infinite divisibility; it can't be *merely* continuity, or merely *immanence*. It *must* embody the essence of polarity and the identity of opposites, and hence it should at least *seem* self-contradictory, paradoxical and ineffable at the relative surface, as we wave seen it echo throughout the centuries in one paradox or another, such as Zeno's.

If we define the essence, or "fundamental" feature of Rationalism as this infinite divisibility (and immanence), what then is the opposite of infinite divisibility that may serve as its nondual identical? Infinite indivisibility? Can we see indivisibility as the "same thing" as divisibility? We can indeed if we take them to the "absolute limit" of limitlessness, Emptiness or infinity (i.e. at the absolute scope).

We will find with much more clarity as we progress that indeed the infinite divisibility and immanence of nondual- or trans-Rationalism is the identical-opposite (the conceptual symbiont) of the indivisibility inherent in the common notions of the continuum. Indeed, it is the infinite divisibility itself that necessitates that every single and finite division can't be absolute or ultimate. There is always a deeper level to divide and hence the continuum is never ultimately or finally divided. With the modern mathematics of the continuum, we know that an infinite division is infinitely small, thus leaving no gap itself in the continuum. It is merely an idealized aspect of infinitely precise position, and between any such two points, no

[i]* See, The Polarity of Zero: The Amphibian of the Transitive and Immanent, p335.

matter how close they may seem, the gap is filled with yet another infinity of indivisible points. The continuum is therefore—by the same infinite principle—fundamentally *indivisible* precisely because it is *infinitely divided,* leaving no gaps. Division, as it traverses the immanent axis toward its ever unreachable "limit at zero," endlessly approaches an "infinitely small point," and hence an *absolute division* is merely one of an "infinite number" of extensionless and *unreachable position*, abstracted out of the labyrinth of the continuum.[i]

If this seems paradoxical, don't worry, it will make much more sense when the framework of Nondual Rationalism is in place. Indeed, it would be entirely suspect if it were not seemingly paradoxical and difficult to grasp when dealing with the infinite and the nondual.

And so we can state our principle of Nondual Rationalism as the following identity of opposites:[ii]

Principle 1: Chord 1: The Fundamental Principle of Nondual Rationalism (PNDR)

Infinite divisibility equals indivisibility.

Explanation: Infinite divisibility necessitates that there can be no fundamental or absolute division because there will always be a deeper level of divisibility, and hence, with infinite divisibility the absolute is fundamentally indivisible. This, we will see, is a nondual codification of the truths underlying Zeno's general paradox, which itself was not so much refuted by the modern mathematics of the continuum, but vindicated by it. Cantor showed that Zeno's paradox is a natural feature of the mathematical continuum.[iii]* Infinite divisions are infinitely small, and any possible gap between two divisions is filled with an infinity more, thus leaving no gaps in the continuum.

Zenoid-Scholium: (A loose allegory) Imagine a chunk of matter is divided in two. Now imagine each chunk divided in two as well. And each of these in turn … *ad infinitum*. What is left when everything is made out of division? A continuum of nothing, or an infinitely folded Parmenidean unity of Being?

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[i] This is Leibniz's notion of a mathematical point as a "terminus," not a real entity. It is merely a direction of unbounded division, the pole of an Immanent/Transcendent axis.

[ii] And our "principle of principles" could state that a principle is merely a tool. A man-made habitual element of a system of thought whose repeated use will prove beneficial when implemented in his entirely fictional construction.

[iii]* See, Back to Zeno, p448.

After discovering the principle of Nondual Rationalism in my study of mathematical rationalism, I recalled—what was likely operating in my subconscious all the while—that the critical distinction between the two substances in Cartesian dualism is that Matter is *infinitely divisible* while Mind is fundamentally *indivisible*. This distinction, in a sense, is also carried into both Spinoza and Leibniz's definitions of the attributes. The PNDR, implicit in Spinoza's philosophy, therefore, directly and simply undercuts Cartesian or Mind/Matter dualism (and its resonances in the Mind/Matter dualism found in Leibniz, to support his pre-rational elements) and dissolves the absolutized distinction by engaging the Taoist identity of opposites to softly call forth a *dialogue* between them. This is, again, an extension or variation—in the form of a simple principle, a kind of koan—on the idea of dependent arising, and in the chapter on Spinoza's Attribute Polarity, this is explicated much further into the concept of "the symbiogenesis of subject and object."

Principle 2: The Un-Principle of Principles:

Principles are not Laws of Nature, but merely distilled and encapsulated concepts, which hold true and useful throughout a system of thought.

Explanation: The principles used throughout this text are not conceived or used as fundamental truths about reality, i.e. Laws of Nature, but merely as pithy and distilled rudimentary or fundamental elements of the system itself. Sometimes they are used as rigidified building-blocks—or as Gerald Lebau would say, as "needles" to the softer, more intuitive semantic "noodles"—and sometimes they are used as resonant keys to unlocking paradoxes and conundrums of the evolving text. Indeed, the Fundamental Principle of Nondualism itself is the key to unfolding its resonant chords, the other principles in this unfolding system.

Infinite Division Equals Indivisibility

The fundamental principle of Nondual Rationalism can be further demonstrated as follows. If we take any region of extension and impose upon it a ***time-ordered***, "stepwise" or sequential process of recursive division occurring ***through time***—say, dividing each segment in half, *ad infinitum*, or dividing space into an infinitely nesting series of spheres (see Figure 2, below)—what we end up with is essentially the continuum of the rational numbers. The mathematics of the modern continuum developed by Cauchy and Cantor, et al shows, however, that the Rational numbers do not

exhaust the full order of the continuum. The rational numbers, Cantor showed, are of the exact same order of infinity (aleph null) as the natural numbers. And the natural numbers, Cantor said, are "countable" or "denumerable," while the continuum itself (the continuum of "real numbers") is uncountable.

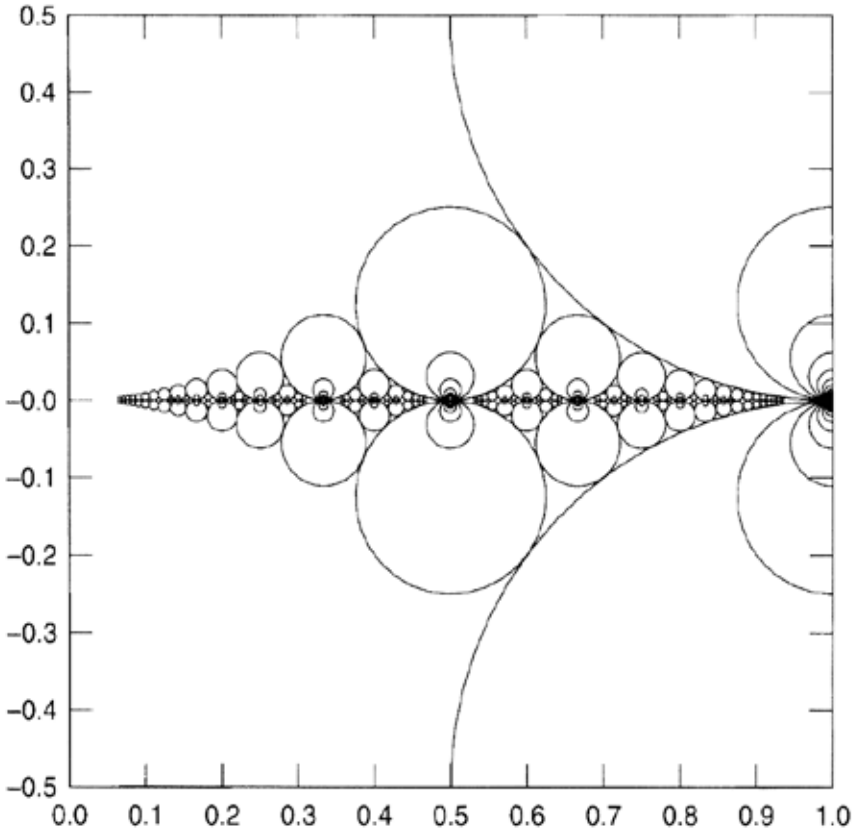

Figure 2: Space in the Process of Infinite Division by Spheres:
This diagram is copied from *Fractal Horizons*, edited by Clifford Pickover. (Frame)

The *time-ordered* and sequential rational continuum, then, is incomplete, and slicing through it intermittently is an infinite series of "Dedekind cuts." These cuts themselves, however, are of zero-dimensional thickness, like an infinitely thin line crossing another. The gaps of incompleteness in the rational continuum are thus "infinitely thin," and nonextended, and thus from the viewpoint of the rational numberline, nonexistent. But they are gaps nonetheless given that the immanent infinities of these Dedekind cuts

and infinite "irrational" numbers cannot be reached by the function of the ratio. Thus when you undertake a time-ordered process of division carried to infinity, not all points on the continuum will be reached, just like the Rational numbers can't reach the "irrationals" or transcendentals. What is left over from this stepwise division process, then, is called "Cantor dust," which is essentially the difference between the countable and uncountable, or first and second transfinite orders of the infinite (and between the transitive and immanent/transcendent VL-axes, as we will see).

As we will discuss further in the section on Zeno's paradoxes,[i]* however, Karin Verelst and others have demonstrated that if we conceive of the division ***not as time-ordered***, but as already existent in the "eternal NOW" (or Spinozan *sub specie aeternitatis*) that mathematical abstraction affords us—or as occurring simultaneously "through and through" as a holarchical "binary tree" of division (a "Zenonian semi-lattice")—then the infinite division itself is equivalent to the order of the uncountable infinity, which is the modern mathematical continuum itself.

It is in this absolute sense, then, that "infinite division equals indivisibility," and what Zeno showed, we will see, is precisely this. His "paradoxes," merely demonstrated the fact of this seemingly contradictory nondual truth which modern mathematics has operationalized and thus ultimately vindicated. What we will find is that Zeno, all along, was not denying the possibility of motion or plurality, but merely demonstrating the first principle of his teacher Parmenides, that the ultimate is ONE. Thus by taking the concept of plurality to the absolute scope of first principles (e.g. infinite division) we end up with the indivisibility of the Parmenidean "Being-now." This "paradox of plurality," Verelst shows, underlies all of Zeno's paradoxes of motion, and thus what Zeno demonstrated is not that motion is impossible, but *indivisible*—every segment of apparent motion is indivisible from an immanent and transcendent, instantaneous and eternal "Being-now."

Thus we will find that the fundamental principle of Nondual Rationalism was introduced at the very beginnings of rationality itself, but it was originally conceived as a "contradiction" or "paradox." And ever since the Aristotelian introduction of the principle of contradiction—inaugurating the exoteric and dualistic form of rationality to come—dualistic rationality could not codify and operationalize the nondual reality (polarity) underlying the very inception of rationality itself. And so it was conceived as an anomaly to be refuted. Indeed, Verelst shows that every attempt at refutation since has injected artificial "non-Zenonian" premises, namely time itself, into the

[i]* See, Back to Zeno, p448.

Zenonian concept of infinite division. This gave rise to the now discredited Aristotelian distinction between potential and actual infinity, which Verelst demonstrates underlies in disguised form all of the subsequent *refutational* strategies *against* Zeno's paradox. What Zeno showed is really that there is duality underlying rationality itself, and we will see in much greater detail just how this duality can be "tuned and triuned"[i]* into a nondual polarity and unity—a triune interface—unfolding at the very heart of Nondual Rationalism and Interface Philosophy.

A Note on Descartes

It must be clarified and/or reiterated at this point why we are taking the unorthodox position that Descartes is a proto-rational thinker, as opposed to a fully rational one. There are several reasons.

1. Cartesian philosophy does not explore the implications of rational mathematics and the labyrinth of the continuum, or what Deleuze calls *immanence* and it does not operate upon the Immanent/Transcendent axis. Leibniz, for example, with his infinitely holarchical monadology, invented the calculus in the process of his deep exploration into the rational continuum, the positive infinity and the secret of rationality. And Spinoza's whole system was founded on immanence in transcendence (yin in yang), with the univocal unity of Substance, whose essence is expressed through its attributes, as the equals-sign between the *indivisibility* of mind and the *infinite divisibility* of matter. But Descartes mathematical system operationalizes the Rational numbers strictly transitively, as opposed to immanently, and his invention of the Cartesian coordinate system is our prime example of the transitive axes. It must be noted, however, that Descartes physical or natural philosophical system does indeed possess infinite depth, but it was simply not explored to the degree, or taken as fundamentally and seriously as the immanence found in Spinoza or Leibniz.[ii]
2. Cartesian philosophy is imbued with the transcendent bias (which we could *almost* claim of Leibniz as well, but his deep exploration of immanence, and his secret Spinozism, saves him here, making his

[i]* See To Infinity and Beyond: Tuning and Triuning the Paradox, p432.

[ii] Deleuze claims, in *Expressionism in Philosophy: Spinoza*, that the critical distinction between the "post-Cartesianism" in Spinoza and Leibniz, and Cartesianism itself, is that Descartes does not address the idea of expression, which both Spinoza and Leibniz take up with a passion in their own ways. In Spinoza, this expressionism works its way through the univocity of immanence and through Leibniz it works through an equivocity, due to his own transcendent-bias. Indeed, their respective uses of expression, univocal vs. equivocal, constitutes, for Deleuze, the prime distinction between Spinoza and Leibniz.

transcendent-bias seem very much an after-thought, which it is almost doubtful he believed in himself), in that God (the absolute) is conceived as a wholly transcendent being. And in Malebranche's occasionalism this God syncs up Descartes' problematic duality of Matter and Mind only on those occasions that demand his attention, such as when I move my fingers on the keyboard right now. An absurd fix for an absurd and *irrational* problem, to say the least. This transcendent-bias captures the Leibnizian and Spinozan critique of Descartes as "having constructed too 'fast,' too 'easy' a philosophy," as Deleuze puts it in *Expressionism in Philosophy: Spinoza*. "Descartes proceeds so quickly in all areas that he misses sufficient reasons, essences or true natures: he everywhere stops at what is relative."

3. Descartes is a dualist, and in this work, the integrated view of Rationalism directly implies, and indeed necessitates, nonduality. Given that Descartes is the epitome of Dualism, then there is an error in his rationalism. We have already cleared up his error rather simply through the Principle of Nondual Rationalism and the identity of opposites, but this works immanently, not transcendently. We could easily call this immanent principle as it manifests in Descartes' work, by his term God, but this renders Descartes' metaphysics essentially a Spinozism. Descartes himself failed to recognize how God reconciled his own problematic dualism. This resulted in the infamous, and rather absurd, pineal vortex explanation and the even more absurd occasionalism of his follower Malebranche (as well as the vastly improbable parallel mind-body fatalism of the Leibnizian "pre-established harmony"). So, In other words, it is a stretch to include Descartes in our classification scheme as a nondual-rationalist. It can, of course, be argued that Descartes philosophy included three substances: mind, matter and God. In this view, then, Descartes would be differentiating and outlining, in a categorical format, the triune interface explored and integrated in nondual forms of Rationalism. But his lack of integration between these categories, regardless of their number, still categorizes him as a dualist, in the context of the nondual traditions. He did attempt, after-all, to integrate his two substances via the pineal gland, rather than through God as did both Spinoza and Leibniz in their radically different ways—Spinoza with his univocal ONE-ALL and its attributes, and Leibniz with his pre-established harmony.

FOUNDATIONALISM, THE INFINITE REGRESS AND THE TRANSCENDENT-BIAS

All things have their backs to the female and stand facing the male.
When male and female combine,
all things achieve harmony.
— Lao Tzu, *Tao Te Ching*

Modern Rationalism is generally identified most strongly with Descartes, and with the notion of foundationalism[i] in the escape from the infinite regress. Descartes, however, was not only, and infamously, a dualist, but he was also a theological apologist. Indeed his whole project *can* be seen in the light of this purpose, to protect Theology, its pre-rational transcendent God and the absolutized category of the immortal soul from the burgeoning mathematical sciences and rational philosophies and from the corrosive effects of doubt on the search for absolute certainty. Likewise, however, while Descartes served to protect the independence of the Mind and soul from dependence on change or death,—and at the same time protecting Theology from the mutating effects of modernity and rationality—he also served to protect science, or natural philosophy, from the stifling dictates of Theology. As Matthew Stewart said, Descartes offered "an armistice of sorts between the established religion and the emerging science of his time."

The idea and Cartesian goal of absolute certainty is itself, however, an absolutization of the *transcendent* or emergent possibilities of the mind, at the expense of the dependency of representational mind itself on the unknowns and unknowables of immanence, and its immediate environment. Spinoza's response, as Deleuze points out, was radically different from this dualistic approach which seeks an independence for the mind. He asks, "What can a body do?" We simply do not know that the immanence in bodies is incapable (nondually or non-reductionistically) of manifesting the

[i] We will discuss foundationalism in much greater depth later. See Foundationalism: Crystalline Pyramids In Emptiness, p641.

emergence of higher levels of intelligence and representation in human awareness, and into our categories of mind and matter. We have no empirical knowledge that a nondual dependent arising, or "symbiogenesis of subject and object"[i]* is impossible, and therefore we have no recourse or reason to absolutize the concepts of Mind and Matter into an irreconcilable pair of categories.

As discussed above, this transcendent-bias toward absolutizing concepts and *a posteriori* generalized categories into Platonic forms and essences taken *a priori*, is one of several points that pushes Descartes toward the *relative* category of a non-rationalist, and indeed a Mind/Matter essentialist. And we have already seen the transcendent-bias transcended-and-included in the rational numbers, which we will explore in great detail in Part Two: Interface Mathematics.

Descartes' own mathematical thinking was essentially transitive, and lacking in immanence (or expression, as Deleuze noted). And the transcendent bias—as we will see—is operationalized transitively, not along the Immanent/Transcendent axis (and we will see that this immanent-transcendent axis is the nondual-rational, or trans-rational, operationalization of the positive infinity, the secret of rationalism as it embodies the polarity of yin and yang as well). This transitive operationalization of the transcendent-bias, is called simply the *trans-bias*, or alternately, the *trans-trans-bias*, to make explicit the double-mapping of the ***trans***cendent to the ***trans***itive, which we will see in much more detail later.[ii]*

Essentially the trans-bias can be understood briefly thus: organisms have evolved the higher sensory/cognitive functions because it substantially increases their "differential reproductive success." The senses look *outward* and provide, in their functionality, both an individual and an evolutionary growth or transcendence. The outwardness of the senses, however, is mapped individually in *lines* of sight, or sound, or *directions* of touch, from one side of the individual to the other. The directionality in these lines of sensation, is a key feature of the definition of the transitive axes (as we will soon see in depth), in that these directional lines of sense, never deal with the infinite immanence within the individual, but pass it over like a blind-spot, generally taking this ever-present immanence for granted. Lines of thought or sensation cannot approach infinite immanence operationally because the zero begins as merely a point on the *line* which it passes over like any other.

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[i]* See the section in Spinoza's Attribute Polarity Emergence, Mnemonic Primitives, and the Symbiogenesis of Subject and Object, p528.

[ii]* See The Image of the Trans-Trans-Bias, p312.

It is from this evolutionary focus on the outside—this arms race to accumulate the intelligence of directionality in the senses—that the imagination is born. This symbiogenesis of subject and object, a process, which we will cover in much greater detail later,[i]* directly encodes the trans-bias into human conceptual thought. This is why we find it so difficult to conceive of infinite immanence, and why we always feel a sense of cognitive vertigo when we can't find a final resting place, or footing for the mind; an ultimate foundation, a fundamental substratum, a "ground of Being."

Indeed, the vibrations of sensation themselves, skip right over the immanence in their transitive motions, so the transcendent-bias is encoded by the very nucleation of matter[ii] itself to allow for its own emergent properties, such as the propagation of waves which occurs at all known levels.[iii] The forces of immanence can only be accessed through the "violation of closure" in the process of division, such as the physical disruption of the atom in the atomic bomb, or the mental omni-directional shrinking of the frame of reference of conception or perception. It is the closure itself that allows agglomerative evolution (and mathematics and philosophy) to begin in the first place, so in any transcending-and-including evolution, there will be a bias for the initial, properties transcended-and-included in the foundations of the evolutionary form, or embryogenesis of the concept. In mathematics, this closure begins, as we will see, with the formation of the first number, one, the quantum from which all the integers are made. And in philosophy it begins with the closure of the concept of the Form, or the Platonic absolutization of the Idea. Just as in reality (at least at our level) it "begins" with the formation of atoms which can agglomerate into higher levels of units such as cells, and so on.

The power of intelligence and therefore of transcendence granted to the agglomerative, evolved organism in sensorially mapping his exterior transitively, in lines (axes) of *direction*, encodes the transcendent-bias directly into the gene-pool of all organisms with sensory functions, as this is translated into the differential reproductive success that (among other intelligent properties) drives evolution forward into higher and higher levels of transcendence.

This transcendent-bias can also be seen in the phenomenon of group-mind. We have a bias for transcending ourselves and merging into a larger whole (or holon), and we tend to spurn (at least collectively) the lone individual—exploring his own infinite differences in immanence—until, perchance, the

[i]* See Emergence, Mnemonic Primitives, and the Symbiogenesis of Subject and Object, p528.

[ii] …and number, as we will see.

[iii] See *Sorce Theory: Unlocking the Basement* in *SpinbitZ: Volume II*

fruits of individual difference make themselves readily apparent to, and accepted by, the group at large.

The power and bias stemming from this tendency can be startling when we come face to face with the irrationalities and atrocities that can manifest when the effect gets magnified and corrupted, such as in cults of personality. This effect shows up as, for example, the willingness of individuals to do things for the group that deeply violate their own individual morals, such as the Nazi effect, and the public ridicule—and even violent ritual murder and dismemberment—of "unorthodox" and "heretical" geniuses.

The transcendent-bias here can be embodied and called forth readily in the image of a herd of animals, driven by fear, back to back, fiercely facing their external enemy, encroaching on all sides.

Acknowledging the transcendent-bias can also be seen as a deep concern in the *Tao te Ching*. The polarity in the immanent-transcendent axis is actually enfolded in the polarity of Yin and Yang. Yin is the female, the inward, the esoteric, the subtle and hidden forces of immanence, in quiet emergence and birth. Yang, on the other hand, is the male, the outward, the clear, the obvious; the active forces of transcendence. When Lao Tzu says, "All things have their backs to the female and stand facing the male," he is recognizing this transcendent-bias. We face the outward, the light and obvious, and shrink from the inward, the dark, complex and difficult. When he says, "When male and female combine, all things achieve harmony," he is recognizing, among other things, the need to embody (or operationalize) the immanent/transcendent, yin/yang polarity, and to recognize, optimize and naturally *flow* with the forces of each.

This identity of opposites between the immanent and transcendent is a crucial key to Nondual Rationalism, and it can be seen as a corollary—a correlating and strengthening strand—to the original Ariadne's thread, the Principle of Nondual Rationalism.

Principle 3: Chord 2: The Principle of Immanence in Transcendence (Yin in Yang)

Immanence equals transcendence (and vice versa).

Explanation: Immanence and Transcendence form an identity of opposites (a polarity) wherein, on the immanent-transcendent axis, any immanent form can be seen as *transcendent to* deeper forms of Emptiness, and vice versa. This can be seen as a corollary to the Principle of Nondual Rationalism: Infinite divisibility equals indivisibility, in that infinite division is essentially infinite immanence, the infinite multiplicity of The ALL, whereas absolute indivisibility maps to the transcendent unitary identity in The ONE. This, we have seen, is directly and simply encoded in the polarity of yin and yang (immanence and transcendence, respectively).

A Brief Note on Foundationalism: Logical and Ontological

There are two distinct categories in the epistemic function of foundationalism: *ontological* (or causal) and *logical*. Ontological foundationalism is the assumption that there is a causal "Ground of Being," a "first cause," upon which all else in the system depends, and which needs no causal justification in order to maintain or justify an epistemic *belief* in it, while *logical foundationalism* is the assumption that there is a single foundation of logic, an axiom or set of axioms, upon which an entire system of logic rests, that likewise needs no justification.

Foundationalism is said to have a pyramidal structure, with a *foundation* upon which all else rests. This structure is in contrast mainly to "coherentism,"[i] in which all propositions and ideas logically and/or causally justify each other by the coherence and consistency of the system as a whole. Coherentism can thus be visualized as a circular or web type structure that works together as a whole to support and distribute its own ontological and epistemic weight.

While it is true that Spinoza *rendered* his system in the geometrical style of Euclid and Descartes—with a foundation of axioms, propositions and definitions—the system of concepts itself can take many different types of rendering. Deleuze's interpretation of Spinoza demonstrates that, contrary to the rigid logical, axiomatic structure into which Spinoza *rendered* his own

[i] We will discuss both foundationalism and coherentism in much greater depth later. See Trans-Folding Models of Knowledge and Truth, p629.

system, this same system can also be rendered in a way that is fundamentally different, and indeed non-foundationalist. Interface Philosophy take this further and gives Deleuze's rendering according to his "logic of expression" a more accessible and explicit depiction in Interface Epistemology. This will mainly be taken up *SpinbitZ: Volume II*, but it has already, and will continue to inform and be worked out in the context of this work, given the interdependency of ontology and epistemology themselves. For now a few comments on foundationalism will suffice to set the desired context of this concept (in relation to the pre-rational *regressive* infinity, and the transcendent-bias) for the rest of this volume.

In *Expressionism in Philosophy: Spinoza*, Deleuze shows that, contrary to the common academic conception, Spinoza's system does not begin or rest on the concept of God or Substance, and therefore it is not necessarily a logical or ontological foundationalism. In the appendix to the book, Deleuze gives a schematic breakdown of the *Ethics* according to his logic of expression. He states, "These eight propositions [the first ones in the *Ethics*, 1-8] are not hypothetical but categorical; it is thus false that the *Ethics* 'begins' with God." He goes on, "Only here [in the propositions 9-14] do we reach the idea of God as absolutely infinite substance" (p 337).

Indeed, according to the interpretation herein, Spinoza does not begin logically, or even sequentially with a definition of God or Substance from which all else follows, and upon which all else logically rests. Rather, logically, he begins in the middle, with a critical definition of the *finite in its own kind*, as that which is limited or surpassed by another modification of the same kind. It is The Infinite (The Absolute), or Substance/God, which hinges or turns on this definition of the finite, the mode, or the relative, as that which is *not* limited by anything else.

Spinoza ultimately sets up a polarity, defining the infinite or Substance/God (our absolute scope) as the identical-opposite of the finite (our relative scope), i.e. that concept which is unlimited, independent and unsurpassed by another deeper cause because it was explicitly defined as the identical-opposite, the context of Emptiness, for the relative scope itself. Indeed, Deleuze also shows how, with univocity, substance "turns around the modes," giving what we are demonstrating herein as a true polarity (between the absolute and relative scopes, essentially, similar to Nagarjunan Emptiness and form). Unfortunately, we will not have the time herein to go much beyond this superficial rendering of Deleuze's expressionist reading, though it is resonant throughout, beneath the differences in terminology.

The reaching of substance, in Spinoza, is ultimately attained only in the abandonment of the immanent representational regress of finite causes, logical/causal dependency and relativity (the relative scope), to a positive acknowledgement of the infinite depth of dependent existence itself (the absolute scope) as the identical-opposite of the finite, or the mode (the relative scope). Essentially, this is an acknowledgement that the relative

scope of modal existence is meaningless *without* the absolute scope, *and vice versa*; a particularly Nagarjunan realization when framed in this way.

Furthermore, this abandonment of the problem of the infinite regress is a typically coherentist move. The infinite regress presents no problem for Spinoza, but rather its very necessity crucially demonstrates the nature of the relative scope, in conjunction with its identical-opposite in the absolute, namely that the interface of the finite (relative) and infinite (absolute) gives rise to the indefinite. This will be explained in much greater depth in our exploration of Spinoza's Triune Infinite, which is an organizing principle throughout his *Ethics*.

This "deep infinity," [i] conceived positively and non-regressively, or *acknowledged* and *affirmed*, as the necessary identical-opposite of the finite, is Spinozan substance, but it is always in a polar arrangement with the modes, the relative scope—just as Nagarjuna's absolute (Emptiness) is always in a polar arrangement with the relative (Form). But, critically, it is in triune arrangement with the attributes—just as the polarity of Emptiness and Form can be seen in triune arrangement with the concept of dependent arising of forms at all levels of Emptiness. Again, this is a crucial pre-echo to the Triune Infinite that pervades Spinoza's *Ethics*.

When we conceive of a fundamental ground of Being, i.e. as a substance, which *at some particular depth*, underlies and manifests all modifications or beings, this is an ontological and causal foundationalism. It is also the default academic and common visualization of Spinoza's system, which accounts for the reason he is so often considered a onto-/logical foundationalist and, in our age of *scientism*, a materialist and reductionist. In the context of the interpretation of Spinoza's substance as an infinite and omni-local axis of depth (i.e. immanence and Emptiness), this ground of Being as substrate is necessarily *transcendent* to the infinite depths below it, and hence it is also *dependent* on them for its own emergence. This level of substance, causal-substrate or ground of Being is then necessarily *a modification* from these deeper levels of immanence (or yin), and not properly a Substance, in Spinoza's sense of the word as independent and non-arising, and hence as Emptiness and absolute scope.

We can see, then, that in this nondual-rational, or trans-rational, interpretation, Spinoza's metaphysics is neither a logical nor an ontological or causal foundationalism. It is often mistaken as such because it does have an absolute from which the relative unfolds and enfolds, or expresses through the triads of substance, as Deleuze might say, and to which it is always dependent in its own arising, but it is always manifesting, or

[i] a phrase borrowed from M.C. Escher

expressing the absolute and relative in a polar arrangement, as "substance [also] turns around its modes."

To the general reader, the positive infinity, or infinite depth opened up by the process of dependent reasoning (and by the mathematical ratio and the violation of the closure property) may seem an infinitely deep problem, i.e. a "disastrous infinite regress," rather than a sought-for solution. But the "regress," in this pre-rational and negative way of conceiving of the infinite, is a direct function of the backward-looking frame of reference of the default foundationalist mind-set itself. The idea that we must search the past, or the inward levels of logical or causal substrates, for an arbitrarily and tacitly preconceived "ultimate beginning," is what initiates the regress in the first place, and if we fail to find our preconceived boundaries (e.g. a ground of Being) in this regressive operation, it is not a problem for infinity or eternity itself, but for our failed *foundationalist* preconceptions.

A positive conception of the infinite regress as also entailing an infinite *pro*gress, a forward-directed emergence and transcendence from infinitely deep complexity, is a key feature of integrative, non-reductionistic or open-ended (and non-dual) modern ontologies and epistemologies. Furthermore, this deep infinity is key to the revolutionary mathematical fields of the calculus, complexity science and Chaos Theory, and a key feature of fractals. Indeed, as Leibniz said in 1692—pre-echoing by two hundred years Cantor's crucial adoption of an "actual infinite," and Mandelbrot's exploration of the fractal by three hundred years—"I hold that Nature makes frequent use of it [infinity] everywhere, in order to show more effectively the perfections of its Author." And in the burgeoning field of complexity science, indeed we are finding the infinite in use everywhere, as infinite recursion is essential to fractal geometry, and Nature herself is increasingly seen to be fundamentally, and at all observed levels, fractal. We see this now, as well, in the exciting fields of Self-Similar Cosmology,[i] and even more so in the physical models put forth in *SpinbitZ: Volume II*.

The last century of ontology and epistemology, coupled with the discoveries of quantum and complexity science, has rendered moot the lingering, peculiarly medieval, fear of the infinite regress and thrown it into positive relief. Instead of viewing the problem from the negative point of view of looking backward or inward to find an origin in space, scale or time, and fretting when these hypothetical beginnings can't be found, the problem is turned on its head. If there are no origins to begin with—in other words, if, contrary to our tacit predispositions, the universe is eternal and infinite (as conceived in Buddhist nondual schools of cosmology), in both depth and

[i] See Rob Oldershaw's Self-Similar Cosmological Model, for instance.

span, then the search for an origin is itself a false problem engendered by the false premise that such an ultimate beginning or ***ultimate foundation*** necessarily exists. The problem of the regress itself is seen to be merely a projection of a regressive, point of view on the infinite or the unbounded nature of reality.

This regress, however always occurs from the transcendent perch of the emergent mind and its generalized, *a posteriori*, categories of representation. This is why the transcendent-bias, the infinite regress and foundationalism always go hand in hand. Falling from the transcendent perch of the mind, and into the infinite abyss, the transcendent-biased mind can't see its regress for what it is. It fails to recognize that it started from transcendence and emergence in the first place, ignorant of the depth (infinite or not) of its causes, and that the forces of immanence play a role in its very formation. It also fails to recognize, therefore, that it is going backward in time and causation to look for an immanent cause after the fact, and that any ultimate cause or immanent substrate, will also be transcendent from the deeper levels on the immanent-transcendent axis. The transcendent-bias then reappears in the very attempt at absolutization of this immanently located transcendent plane. The bias then encounters itself and its own necessary failure in absolutizing the relativity of planes or forms in the Emptiness and boundlessness of the immanent-transcendent axis.

Substance and Bundle Views of Substance

The epistemological framework for foundational ontologies would counter a "disastrous regress" by positing a root-level scale or substratum of axiomatic origin for the higher-level modifications and forms made therefrom. One of many problems with this scenario, however, is that a medium cannot have conceivable properties with which to be modified without deeper levels of complexity and form. As a logical corollary, a foundational level of axioms cannot be questioned and indeed there can be no logical or epistemological justification for the existence of those axioms. Hence in foundational models they are said to be "self-justifying," which, as scholars seem to generally agree, is merely a statement of belief that they *need* no justification, and very often the foundation-level axioms are far from intuitive or self-evident.

This is intimately related to the foundational dichotomy of the "*substance* and *bundle* views of substance." Substance views posit that the ontological foundation (generically called substance) is an amorphous and property-less substratum in which properties (or modes) inhere, and from this foundation, patterns, modes and objects, with their attendant properties, can emerge. Bundle views, on the other hand, posit that such an amorphous substance without properties is meaningless and that properties themselves are the only things that are real, having and needing no substance in which they inhere.

Each absolutized view has a damning criticism of the other, each opening the other to yet another dependent arising, and identity of opposites. The bundle-view critique of the substance-view can be explained thus; properties and modifications could not *inhere* in substance if it had no *inherence properties* in the first place. In other words, if substance had no properties to begin with, such as the property of modifiability, then how could it ever be modified into patterns, modes, objects and higher-level properties, in the second-place? Doesn't modifiability presuppose properties that can be modified, at the very least generalizable as the property of modifiability or inherence itself? Isn't substance, therefore, at the very least, necessarily pre-modified with the property of modifiability—whatever that must entail? Conversely, is it really any better to take the view that there is no *substance* to reality and that it is all merely bundles of properties *ultimately* inhering in … absolute nothingness?

With this dichotomy of opposing and equally bizarre paradoxes in mind, it is clear that each contains a truth in its critique of the other, as well as a relative truth in its basic concepts. Therefore, as is usual with controversies that rage for centuries with brilliant proponents for each side, the truth is likely somewhere in the middle. This is specifically true in the case of heated intellectual controversies over competing models each of which has a broad base of adherents all recognizing some validity to their preferred model.[i]

A case in point is the "nature v. nurture" debate in which it is now understood that both sides were correct and that nature and nurture both play key, indeed symbiogenetic roles in the development of the individual. It is clear therefore, and we have many historical precedents to spur us on, and an integral model (Integral Methodological Pluralism) to pull us forward, into the view that some integration of this useful differentiation between substance and bundle views is in order.

But what can a "substance-bundle view of substance" look like (to temporarily retain the cumbersome nomenclature)? And for the logical aspect, what would an axiomless-axiom look like? A useful clue for resolving the "substance-bundle" dichotomy can be found in the identity of opposites and in our *Principle of Nondual Rationalism: Infinite divisibility equals indivisibility*.

In nondual philosophies all dichotomies and opposites are symbiogenetic (to use a more modern and precise vocabulary) or "other-engendering and other-necessitating." In other words, neither substance nor its modifications can exist one without the other. Neither substance nor its bundles (properties formed from low-level modifications) are foundational, but both must exist at every conceivable level whether the substance *appears*

[i] Indeed we will come to see this historical pattern of conceptual differentiation, which generates a highly polarized false-dichotomy, which in turn must finally be integrated into a symbiotic (and symbiogenetic) conceptual polarity, or indeed a complimentary set of practical axes, or praxes.

continuous and amorphous or not. This is explicitly embodied in the non-dual notion that form and Emptiness are one, and this is also embodied in the theosophical notion of a "rootless root."

In the context of the Principle of Nondual Rationalism, we can see the bundle views as correlating with infinite division of substance into its deeper properties, and the bundle views as the assertion that the absolute is fundamentally indivisible with respect to properties. We saw that in the case of numbers, this infinite divisibility actually gave rise to the fundamental indivisibility of the absolute, in that there can be no end to division and therefore the absolute cannot finally and ultimately be divided. As an analogy, we can say that because there is, and can be, no final propertyless substrate, and therefore there are always deeper levels of modification leading to properties, then substance, at all levels, can have the property of further modification, or dissolution.

This means that the substance-bundle dichotomy, as should be expected, is purely a function of the foundational bias in modern thinking, which has only begun to wind its way out from the abstractions of the ancient monasteries of nondual practices and the modern ivory towers of academic epistemology.[i] Substance views appear correct when we are at a level that appears amorphous, yet the fact that this amorphousness and *morphability* are themselves properties tells us that there are yet deeper levels of morphology statistically arising as these emergent properties. Conversely, at this point the bundle view might appear correct if it were not for the recognition of the absurdity of the assumption that properties (bundles) could inhere in nothingness, and again that there are always deeper levels of substance in which these properties inhere, or from which they emerge. This means that at every level there are necessarily both substance and bundles, stuff and its properties. And yet again we can see this in the context of dependent arising, and the identity of opposites.

It must be mentioned that precisely because of this irreconcilable dichotomy, Substance, for Spinoza, was not defined as matter, or even an immanent substrate of matter to give "substance," in the common way of understanding it, to modifications. The substance in the substance-bundle view dichotomy is not Spinozistic substance. It is merely an "amorphous

[i] This treatment, of course, is only meant to be suggestive of the solution, and in order to rigorously counter the many objections from academia regarding this clearly "easy fix" for a problem that has been raging for centuries, I would have to fully explicate the implications and intrinsic connections. This I plan to do in SpinbitZ, but for now, the suggestion indeed may be all that is needed for some to grasp the usefulness of the solution and begin to employ it.

aspect"[i] of matter, not Emptiness and the infinity or boundlessness of immanence and transcendence at the absolute scope.

But what of an "axiomless-axiom," as in the category of logical foundationalism? The pattern should be obvious; the axiomless-axiom is the logic-version of the rootless-root. ***The only irreducible axiom of a system must be the postulated irreducibility itself***, and it must be maintained in "epistemic space," i.e. with the unambiguous treatment of these axioms as purely mental constructs, or "orienting generalizations," as Ken Wilber might say.

This is essentially Spinoza's Substance, the positive infinity as the secret of rationalism, and the single "axiomless-axiom," which renders Spinoza's system a "foundationless-foundationalism," in that its very foundation *is* foundationlessness, or Emptiness, itself, i.e. the absolute scope. This axiomless-axiom will be expanded in the Vision-Logic Coordinate System (VCS) as the single (yet non-/omni-local) axis abstractly embodying the infinite regress itself in positive form taken as an *a priori* unity, also as an *infinite* ***pro****gress*, (depending entirely upon the direction one is "traveling") with no beginning nor end (boundaries) in time, scale or space.

[i] Note that this "amorphous aspect" is also the definition of the "ether" in Gerald Lebau's Sorce Theory

PART ONE: THE BASIC FRAMEWORK OF INTERFACE PHILOSOPHY

THE INTERFACE BETWEEN INTERFACE PHILOSOPHY AND NONDUAL RATIONALISM

Nondual Rationalism—as we have seen and will see in much greater detail—in contrast to modern exoteric rationalism, is already a trans-rationalism. The esoteric project of rationalism in this book is now in a healthy state of completion (though, at this page it has yet to unfold in its entirety). And so, as we will see, through the use of the higher-level—trans-rational and vision-logic level—Interface Philosophy, the mathematical and philosophical elements of Nondual Rationalism will unfold in perfect harmony and operation upon the axis inherent to the rational itself, the Immanent/Transcendent axis at the core of the Principle of Nondual Rationalism. Thus, a Nondual Rationalism naturally forms the transcended-and-included "foundation" for a nondual philosophy, and in this case it forms the base of trans-rational Interface Philosophy.

In the embryogenesis of this work, these two philosophies unfolded in a tight symbiogenesis, the interfaces forming a higher-level scaffolding and perspective from which to see the resolutions to the deeper dualities and paradoxes. At this point in the game, we have yet to see much of this unfold, but it will become readily apparent as we progress.

EMBRYOGENESIS OF THE CONCEPT (EOTC)

The Tao begot one.
One begot two.
Two begot three.
And three begot the ten thousand things.
— Lao Tzu, The Tao Te Ching

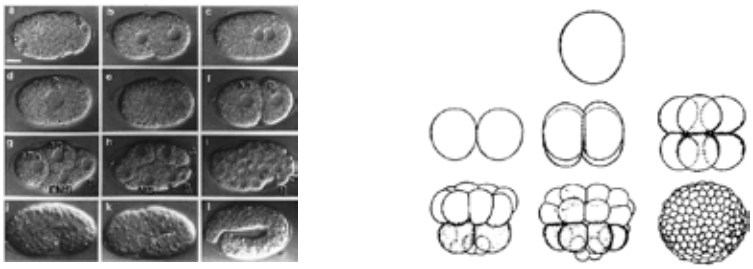
Because evolution itself, on its various planes, unfolds from simplicity to complexity through a process of "multiplication through division" and "differentiation and integration" (e.g. cellular mitosis from a single cell to an integrated multicellular organism), the ideal explication of conceptual categories and orienting generalizations should be, at least in part, a similar organic process of growth, just as it also occurs in the definition of healthy development in the integral models of developmental psychology.[i] This cellular growth process is a multiplication-through-division whereby a general conceptual unity or category is broken into a specific, integrated and functional multiplicity through a recursive differentiate-and-integrate process.

We will see this process in the development of dependent arising, from the general concept of dependent arising through the more specific attribute parallelism of Spinoza to the tetra-arising of Ken Wilber.[ii] Indeed, we can see this process occurring all the time in conceptual development. First there is a general concept of organismic development. Then there is a theoretical distinction made, such as that between nature and nurture (i.e. genetic vs. conditional/environmental factors). Next, factions divide up along opposing sides of this line, exploring each option on its own terms in opposition to the other. This creates a controversy, dichotomy and dualism that cannot be

[i] See the work of Ken Wilber, for an overview.

[ii] See From Dependent- to Tetra- Arising: The Conceptual Embryogenesis of AQAL, p560).

resolved at this level of factional distinction. Only when we recognize from a higher level that the distinction itself is important, not any side over the other, can we move forward. And in this way the original conceptual distinction and differentiation, the new functional polarity, is integrated into a higher level of functioning as we move from simplicity to complexity in the embryogenesis of the concept.



A. B.

Figure 3: Embryogenesis of the Concept:
A) A generalized image of cellular differentiation. B) The embryogenesis of the worm c. elegans.

This ideal process—an embryogenesis of an "orienting generalization holarchy"—would begin with unity and maximum generality (a single conceptual cell) and end with an integrated and comprehensive multicellular conceptual organism. When such a scheme is viewed from the outside—and this is the function and power of a Vision-Logic Coordinate System—one can ascend or descend to any level of generality or detail one needs, from indefinitely detailed multiplicity to simplified conceptual unity. One can then jump into the system at that level. This would enable people of virtually all stages of intellectual development to understand the system naturally at their current preferred level of specificity.

Ideally, this holarchical unfolding begins with a chosen orienting conceptual holon of abstract unity which is then divided (multiplication through division) into a polarity. The focus is then placed on the integrating interface between the two poles of the polarity which manifests the inherent triunity in all polarity: the interface itself becomes the "cultivated third"[i¥] in the triunity. In some cases, it could go the same for the next levels of

[i¥] "cultivated third": a term borrowed from Michel Serres

recursion; the conjoined interfaces, integrations and intercourses between the compartments are given focus and manifest a new integrating level of further differentiation. Or it could be that the new holons from the first division, undergo a similar process of differentiation themselves, a holonic mitosis, and the process repeats.

These two methods, analogous to sex, in the first instance, and mitosis in the second, would likely be intermixed throughout the developing organism, depending on the specific natures of the conceptual holons and their interfaces and relations between other holons. In any case, the previous, more general conceptual level of description is *transcended-and-included* by a more specific and detailed version of itself. Unity differentiates into polarity which integrates through triunity which differentiates further into multiplicity, "the ten thousand things" and so on.

The critical point is that ideally, this history would be recorded, or reconstructed, so that one can see the whole from the outside (the level of vision-logic, which we will explore shortly) and travel up and down between levels of description, from general unity to specific multiplicity, because this orienting and zeroing-in general-to-specific, transcend-and-include holarchical historical procedure ensures that the ONE is included in differentiation to the MANY just as the MANY is transcended and integrated back into the ONE.

This is an idealized description of the evolution of knowledge systems from simple to complex. "Complexity is but the many faces of simplicity,"[i¥] but it can only unfold this complexity, in such a simple and orderly fashion, near the root level. At the higher levels, the complexity takes on its own, far more interesting and critical forms and attractors.

To be sure, these abstracted categories at all levels are designed to fit the function of the model at hand (the categories and concepts herein are no exception), and it is indeed arguable (as we have discussed) that properties themselves cannot exist without the substance already being modified and complexified (enfolded) at deeper levels, and *those* properties required for such complexity and modification can't arise without deeper levels, ad infinitum. In other words, ultimate simplicity and unity is ultimate abstraction in the representational layer of the embryogenesis of the concept. In reality, Unity *is* Multiplicity, the ALL is the ONE.

With this ideal embryogenesis of the concept in mind, the delineation of this conceptual scheme will hopefully unfold in the most natural progression as it works itself out through the basement level tombs of the pyramid of complexity.

[i¥] From Gerald Lebau

In retrospect, however, it is interesting to note that this book, while working along a similar process of the embryogenesis of the concept, was also simultaneously written inside out, from complex to simple, or from specific and higher-level to general and fundamental. In the real world, as individuals, we begin in the middle and work in both directions simultaneously—differentiating and integrating, transcending-and-including in both immanent and transcendent directions, and mapping it all out, transitively and conceptually—creating the future at the same time we reconstruct the past, in this embryogenesis of the concept.

As I progressed in my differentiating-and-integrating of the details, I moved nearer and nearer to the most fundamental guiding concepts and principles of the whole. There is as much "rhizomatic writing," as Deleuze puts it, or sprawling, nonlinear, tangential "lines of flight" as there is a tree-like hierarchy in the actual embryogenesis of this work. This is why this book has been so difficult to write. So much of it does not fit into a linear hierarchy of importance. It is all extensively interdependent so that the concepts introduced first inevitably end up lacking in the much needed context that must wait until later down the line.

Indeed, much of this work was culled from a much larger and far more sprawling work (simply titled SpinbitZ), essentially an unpublished 600 page collection of notes. By the end of writing this sprawling complex I had found the root level distinctions and concepts needed to make much more sense of the whole thing. Much of this work herein, is then effectively turning much of that immanently directed process inside out and beginning where I ended in my research, remapping, infusing and integrating those fundamental final elements throughout the whole, in part through the use of the EOTC.

PHASE ONE: UNITY

This is the simplest, most abstract and general level of conceptual orientation. The absolute level of Unity is purely abstract, enfolding all possible descriptions and polar conceptions. Because it is the indivisible essence of everything and beyond or prior to polarity, all adjectives and analogies apply to it equally and therefore none have any conceptual differential advantage over any other. That is why the absolute is ineffable. This is also why some people choose to call the absolute 'conscious,' or 'intelligent' or 'living,' and others not. All and none of these adjectives apply simultaneously, because all of their identical-opposites are also necessarily enfolded at the absolute scope.

In the embryogenesis of the concept, absolute Unity is not the ultimate ground of Being, but merely the simplest, most general level of description available that conveys, contains, or exfoliates the desired message, resonance or feeling of the whole. Furthermore, in the representational level of the embryogenesis of the concept, Unity is not even the chronological beginning. It was, and is always, "historically" brought into being from multiplicity, specifically through the extension of polarity and the relative scope to its ultimate self-defining end, to find its context-defining identical-opposite in the absolute.

In the case of this ontological system, however, Unity is nondual: it is "not two," and in the same sense that it is "not two," it is "not one." Unity is never without its identical-opposite, multiplicity, in the ALL is ONE; the representational and the sub-representational.

In Interface Mathematics we will differentiate Unity into two different kinds, according to the difference in scope, from relative to absolute.[i] These two kinds of Unity are then finite "unity" and infinite "Unity," because finity and infinity (*apeiron*) are the mathematical aspects of the relative and absolute scopes, respectively.

Essentially, the Unity at the absolute scope, is non-quantitative. It is not one; not a finite "unit" or "unity." It is rather, the *ALL-is-ONE* of infinite Unity and multiplicity, because it enfolds the totality of existence, as a Deleuzian infinite difference and multiplicity, in a single symbol. There is no other thing or symbol, at this absolute scope, to give this Unity the operational context of a number. This is yet another pre-echo of the critical polarity

[i]* See, Unity and Nonduality, p239.

between infinity and number, essentially the same resonating fundamental polarity of scope we keep encountering, and which is the essence of Nagarjunan nonduality. In the quantitative sense, we will encounter it in the concept of boundary, or finity, in that a number itself is essentially and necessarily represented as a boundary, in the nondual context of the boundlessness of Emptiness, or infinity.

PHASE TWO: POLARITY AND THE OPPOSABLE THUMB OF THE MIND

Alan Watts explained the concept of polarity very simply when he said, "The axis of opposites is the perception of polarity. The difference between them is explicit, but the unity is implicit." We speak (explicate) in terms (terminals) to make things nice and simple, black and white, but we know that between black and white there is always at least a *little grey* on the edges of vision.[i]

Mankind breaks into consciousness through the use of sensory, and then conceptual contrasts: light-dark, hot-cold, sharp-dull, loud-quiet, and so on. This is the defining feature of the relative scope: one sensation or concept in relation to the other.

M. C. Escher writes in his essay, *White—Gray—Black*:

> Life is possible only if the senses can perceive contrasts. A "monotonal" organ sound that is held too long becomes unbearable for the ear, as does, for the eye, an extended solid-color wall surface or even a cloudless sky (when we are lying on our backs and see neither sun nor horizon). It seems, so I have been told, that the following torture was practiced by the people of an ancient culture: the head of a prisoner who was to receive punishment was tied immovably in place in such a way that his eyes could not observe anything other than an evenly lit, smooth, white-plastered wall surface (one can possibly imagine it as being concave).
> The sight of that "nothing," completely lacking in contrast, on which the eye cannot find a supporting or resting point (as a result of which an awareness of the concept of "distance" also disappears), becomes in time unbearable and leads to insanity, since our willpower isn't strong enough to keep our eyes closed continuously.
>
> Isn't it fascinating to realize that no image, no form, not even a shade or color, "exists" on its own; that among everything that's visually observable we can refer only to relationships and to contrasts? If one quantity cannot be compared with another, then no quantity exists. There is no "black" on its own, or "white" either. They only manifest themselves together and by means of each other. We only assign them a value by comparing them with each other.

[i] …or if one is lucky, always in the center of it.

This passage brings to mind my own experience, albeit self-imposed, with sensory uniformity. I sleep to a background of white-noise; painstakingly searching the radio-waves for a reliably dead channel. In a sense it is "turning up the silence," as I crank up the "noise floor," to drown out the distracting sounds around me. Occasionally—when I would enter a certain entheogenic, contemplative state—as my brain tried to grasp and make sense of the uniformity—interfacing my mind with this rather loud homogeneous and smooth "floor," or "wall" of noise—I would experience the most complex and beautiful soundscapes. It sounded and felt as if I were inside a battle arena for helicopters and weed-eaters spinning and whipping their whooshing and humming threads and blades around my head in fractal patterns, surrounding, infusing and fabricating a vastly intricate auditory space; creating it all out of the reactionary "thin air" of the brain's attempt to deal with—to *relate to*—unrelenting uniformity, homogeneity and immanent Unity.

This self-imposed auditory insanity was indeed breathtakingly and frighteningly beautiful, but if I did not will it into action myself and release myself into this monstrous and powerful state of mind, I can certainly imagine the torturous mental state that could ensue.

Polarity is one of the most, simple, pervasive, powerful and critical concepts to become aware of. It can be seen virtually everywhere in thought and nature at the most rudimentary and fundamental levels. Observation itself functions on polarity in multiple ways. The nerve cell either fires or not and all perception is, at the basis, contrast dependent. Perception breaks into subtleties as it matures, certainly, similar in this way to the embryogenesis of the concept, but in the beginning it is fundamentally polar, and retains a strong element of polarity throughout its course.

We cannot function without differences and extremes. In thought and language, pairs of opposites are ubiquitous. And for pinning down a distinction they are as indispensable as an opposable thumb. As powerful as they are, however, they can easily be abused through ignorant and/or dishonest manipulation, such as in a bait and switch, or in the very common rhetorical and political divide-and-conquer devise of the false-dilemma.

PHASE THREE: TRIUNITY: CULTIVATING THE INTERFACE OF POLARITY

At every polarity there is a boundary, an interface. This accounts for the psychological power of the number three. It gives resolution to duality in the recognition of unity in polarity. These interfaces exist everywhere there is a gradient, and that is indeed everywhere at some perceivable level—e.g. the markedly different properties of the surface of water as opposed to its depths and the air above it; the present as interface between the past and the future (memory and anticipation); the human as interface between the animal and the divine, as a recognition of the gradient between the origins and potential (the current stage as a "developmental interface") of humanity; the triunity in the dialectic (thesis, antithesis and synthesis). And Ken Wilber's "pre-trans fallacy" is a perfect example of the codification of this realization into a cognitive tool for straddling any developmental interface and triuning its polarity.

In *The Two Hands of God*, Alan Watts gives a good illustration of the triunity of polarity:

> [Polarity] is something much more than simple duality or opposition. For to say that opposites are polar is to say much more than that they are far apart: it is to say that they are related and joined—that they are the terms, ends, or extremities of a single whole. Polar opposites are therefore inseparable opposites, like the poles of the earth or of a magnet, or the ends of a stick or the faces of a coin. Though what lies between the poles is more substantial than the poles themselves—since they are the abstract "terms" rather than the concrete body—nevertheless man thinks in terms and therefore divides in thought what is undivided in nature. To think is to categorize, to sort experience into classes and intellectual pigeonholes. It is thus that, from the standpoint of thought, the all-important question is ever, "Is it this, or is it that?" Is the experience inside, or is it outside? By answering such questions we describe and explain the world; we make it explicit. But implicitly, in nature herself, there are no classes. We drop these intellectual nets and boxes upon the world as we weave the imaginary lines of latitude and longitude upon the face of the earth and the, likewise imaginary, firmament of the stars. It is thus the imaginary, abstract, and conceptual character of these divisions which renders them polar. The importance of a box for thought is that the inside is different from the outside. But in nature the walls of a box are what the inside and the outside have in common (p49-50).

The phrase, "the walls of a box are what the inside and the outside have in common," brings us to the triunity in polarity. In the following diagram I have emphasized the triuning Emptiness of polarity in the ancient Chinese Yin/Yang (see, Figure 4, below), showing the walls of the box of this ancient "Diagram of the Supreme Ultimate."[i¥]

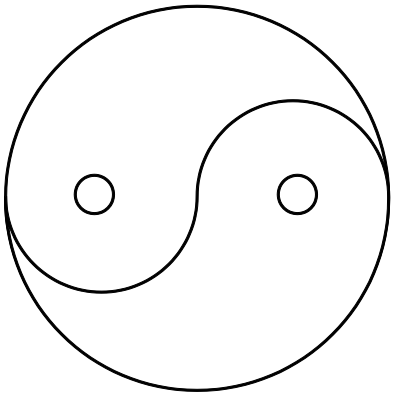


Figure 4: The Yin-Yang of Emptiness and Form:
The values of the polarity have been removed so we can focus on the triuning interface between the poles; walls or interfaces without which the opposites couldn't emerge and persist. And thus arises another polarity, that between the original polarity, now seen as the white space, and the interface itself, the black lines which divide it, i.e. Emptiness and Form.

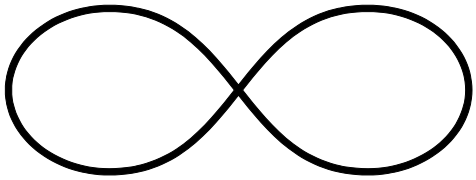
Between all poles there is an interface and beneath all interactions there is deeper ground of Being. This triunity can be seen in the "lazy eight" infinity symbol below, where each lobe is formed from the continuation of the curve of the other and both are unified through the one curve passing between them, (see Figure 5, below).

The Escher drawing with the infinity sign presented as a mobius strip shows more clearly the duality of finite unity, and inversely, the unity of finite duality.[ii*] The single circular strip can be twisted in such a way that the distinction between the inside and outside dissolves, revealing it for the relative division that it always was.

[i¥] <http://www.hartford-hwp.com/archives/55/069.html>

[ii*] See Finite Unity: "Unity is Plural and at Minimum Two", p246.

A.



B.

C.

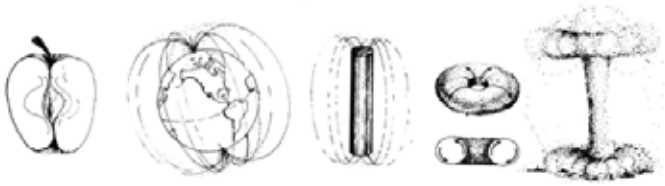


Figure 5: Polarity:
A) The infinity sign. B) Escher Drawing "Mobius Strip II." C) The lower half of a diagram from Buckminster Fuller's *Synergetics*, originally illustrating the polar concept of involution and evolution.

In *The Joyous Cosmology*, Alan Watts says:

> The principle is that all dualities and opposites are not disjoined but polar; they do not encounter and confront one another from afar; they exfoliate from a common center. Ordinary thinking conceals polarity and relativity because it employs terms, the terminals or ends, the poles, neglecting what lies between them. The difference of front and back, to be and not to be, hides their unity and mutuality.
>
> It is thus when anyone draws attention to the implicit unity of polar opposites we feel something of a shock. For the foundations of thought are shaken by the suspicion that experiences and values which we had believed to be contrary and distinct are, after all, aspects of the same thing....(p49-50)

This is the identity of opposites, which has been implicitly in operation throughout the text so far, and which is key to Nondual Rationalism. Indeed,

from this analysis of polarity and the identity of opposites, we can draw another thread from a resonance with our original Principle of Nondual Rationalism, to entwine in our Ariadne's Cable, leading us out of (transcending-and-including) the labyrinth of the continuum.

Principle 4: Chord 3: The Principle of Absolute Reversal (PAR)

Any pole of a polarity (a term, property or concept), taken at the absolute scope, becomes, or leads to its identical-opposite.

Explanation: Given the identity of opposites, any term (or terminal of a polarity) whose identical-opposite is neglected when taken to the absolute scope, will rebound, reflect or refract into its identical-opposite. This is because the absolute scope is ineffable and the very opposite of relation. Terms, concepts and other relations, have no function at the absolute scope, and the identity of opposites always reveals itself when taken to extremes.

We have already seen the PAR in action in *Chord 1*, the Principle of Nondual Rationalism, "Infinite Division Equals Indivisibility," because the concept of divisibility (neglecting to include its identical-opposite of indivisibility), when taken at the absolute scope (whose quantitative property is infinity), "necessitates that there can be no fundamental or absolute division because there will always be a deeper level of divisibility, and hence, infinite divisibility necessitates that the absolute is *fundamentally* indivisible." In this way, divisibility, taken to its absolute scope, becomes indivisibility, enacting our Principle of Absolute Reversal, because infinity is boundless. See the example below which will help make sense of both the Principle of Nondual Rationalism and the Principle of Absolute Reversal, and note also how it resonates with our Principle of Immanence in Transcendence.

Chord 3 Example: The Inverse Unified Field

We can find a simple Zenonian and Parmenidean example of this principle in action in the current state of fundamental physics. Physics has long been operating on what I call a "solid-bias" intrinsic to human evolutionary thought (this will be detailed in *SpinbitZ: Volume II*), where solidity is generally opted for by the lowest common denominator, the "forces of representation" operating in human thought and communication. This conceptual/representational preference for solidity over fluidity is due to

the simplicity (the lack of internal moving parts) of solidity, and due also to our evolutionary formative feedback with solids, as "man the tool-maker." Furthermore, Science, with its premature abandonment of rationalism, and indeed metaphysics, in the enlightenment, has gotten stuck in a medieval foundationalist outlook, always looking for the *smallest, simplest,* most "*fundamental* particle" (foundational solid), the absolute "building blocks" of existence.

This is the ancient Greek *atomos*, the "uncuttable" ultimate solid constituent of reality, floating, bouncing and colliding in the (existing) nonexistence of the void.[i] After the uncuttable "*a-tomoi*" were apparently discovered, and then surprisingly (to some) turned out to be "cuttable" after all, physics continued its search for the final uncuttable solid building blocks. To this end, the standard model of particle physics has reduced all of reality to a growing "particle zoo" of mathematical solids known as "point-particles."

Nonduality, however—not to mention the ultimate quest of modern unification theories in physics—necessitates that ALL is fundamentally ONE "substance"—a unified field. It is commonly assumed that a foundational atom-void, particle-based model is a postulation of a single substance—that stuff which makes up the *a-tomoi*—but this is incorrect. The atom-void is a tacit polarity between two substances with opposing absolutized (yet minimally inter-expressive) properties; the solidity of particles and the fluidity or non-solidity of amorphous space (such as air), the uncuttable and the infinitely cuttable, and ultimately between thingness (form) and no-thingness (Emptiness). Perhaps it is tacitly assumed that since nothingness does not exist then to postulate its existence (?) as space or the void, in addition to the fractured somethingness or substance of the atomos, is still to assume a singular substance—the atomos. But since this nothingness (this now existing non-existence of the real void), is what defines the limits of the myriad atomic somethingnesses, then this nothingness plays a causal role in the very identity of the atoms as well as providing the causal context for the atoms, the field of interaction and inter-expression of the "laws of motion". The existing non-existence of the void, the Emptiness, in a sense, limits, forms and cuts the uncuttable substance of the atomos into its fractured multiple identity.

These esoteric considerations aside, due to the constant feedback or interface of science with empirical reality, this *absolutely uncuttable* atomos (taking form, solidity and indivisibility to the absolute scope) has been cut so

[i] Most rational physicists have come to understand that space, or the vacuum, is not void but rather teeming with an abstraction called "energy" which simply means "the ability to do work." But since Einstein's initial and self-confessed premature reaction was to throw away the term (a)ether as denoting the substantial aspect of the vacuum, now the term is anathema and we must speak in abstractions like "energy".

much by the intervening nothingness (in the minds of the physicists) that the original Greek *a-tomoi* are now extensionless points existing in a sea of nothingness. This is the "infinite smallness" of the mathematical point, the absolutized relativity of somethingness and form down to the absolute immanent size of nothingness. Having no extension, they are, fundamentally uncuttable. They take up no space and have no diameter to halve.

So we already see that Form, when taken to the absolute scope, the infinity of infinite smallness, becomes the non-form of Emptiness. And we can see that this is a resonance of our Principle of Nondual Rationalism, that the infinite divisibility in the foundational search for the "fundamental particle," the inverse-ultimate form, has ended in the non-particle, the non-form of the mathematical point—the implicit singularity of Emptiness.

In other words, since the size of these point particles is zero, this nothingness of "empty space" is effectively divided by merely another sizeless nothingness—the *idea* of form which has lost its size and extension, and indeed its existence in either the imagination or reality. **The absolutized somethingness of physics is dually-described yet ultimately a single infinite nothingness.** Taking somethingness and Form to the absolute scope has rebounded, reflected or refracted through the ineffable absolute to return its identical-opposite, Emptiness. And, as a corollary, a solid has reflected off the absolute in the form of a fluid: The Inverse Unified Field.

It is quite an interesting time in history that modern Physics has reached the EXACT inverse of the truth necessitated by the metaphysics of causality and esoteric science. By abandoning rational philosophy, with its irreducible nondual aspect of extension, the physicists have "somehow" (*ad hoc* and acausally) reached the simple axiomatic level of the Inverse Unified Field, or a "unified nothingness," which is now only describable by similarly causally-empty and abstract entities such as "space-time," "extra-dimensions," "probabilities," "randomness," and "uncertainty," because nothingness—whether pseudo-extended as an existing nonexistence, a void, or non-extended as a point-particle—does not, and cannot 'possess' real properties or causality. This logically-derived unity (inverted or not) is ironically quite an accomplishment and a testament to the self-correcting power of empirical mathematics, driven by a medieval foundationalism, and operating on blind (acausal) quantitative logic in the face of human misconception and misinterpretation.[i]

[i] The unconscious metaphysical inversion of substance into its opposite, the void, with its incompatibilities and nonfunctional paradoxes shows directly that physics is incorrect at the very core of its reductionist paradigm, the solid-/particle-bias. When the model finally becomes too top-heavy, with its umpteen-dimensional, semantically void, space-time knots leading to ultimate

Detecting the PAR

A common way to tell if this Principle of Absolute Reversal is in need of invoking, is with the use of the terms 'pure,' 'infinite' or 'eternal,' (or with similar extremes) especially in ontological, metaphysical or epistemological contexts. According to the PAR, equating the absolute with the *pure* state of any aspect, such as "pure consciousness," one must also take its identical-opposite, or at least qualify this purity as not invoking an absolute stance. So if the absolute is pure consciousness, it is at the same time pure unconsciousness, because one pole cannot exist without the other and the absolute transcends, includes and exfoliates all polarities.

This can be seen in the concept of locality. When we take the absolute negation of locality, the assumption is that we reach non-locality. But non-locality can be seen as the identical-opposite of omni-locality. Indeed, they share the same aspect of formlessness. Locality itself necessitates the separation of one locality at the exclusion of the others. When you remove that locality, you end up in the same place as when you add everything negated: Formlessness, or Emptiness. (Note the resonance here with the Inverse Unified Field.)

Likewise, "infinite freedom," as infinite any*thing*, is to limit the unlimited (the absolute), by a concept (the relative). The infinite is ineffable, unrelatable, yet infinitely relatable, because it both unfolds and enfolds all poles, term-inals and relations. This is why we fall into conundrum when we place concepts at the infinite, absolute level. The absolute is not a concept, such as freedom or causation.

By the Taoist identity of opposites and its extension into the PAR, if you place one opposite at the absolute level, you must place its opposite there as well. Thus infinite freedom must equal infinite causation, and vice versa. This ancient operation in the identity of opposites may indeed be the source and resolution of all our cherished paradoxes. We will see the above as a pre-echo in the concept "Infinite determinism equals indeterminism," yet another resonant strand in our Ariadne's Cable of Nondual Rationalism.[i]

The Omni-Non: The Binary Logic of the Absolute/Relative Interface

The above interface with the Principle of Absolute Reversal and the absolute and relative aspects of locality, provides a nice illustration of a recurring aspect of the interface between the absolute and relative scopes. Generally it

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incomprehensibility, then the whole thing will flip right-side up again in the true nature of a scientific REVOLUTION. See *SpinbitZ: Volume II*.

[i]* See Principle 1: Chord 1: The Fundamental Principle of Nondual Rationalism (PNDR), p84.

is the case that when a relative concept is taken to the absolute scope of the ALL-ONE or omni, its meaning is effectively negated. This can be readily seen with the relative concept of number taken to the quantitative or multiple aspect of the absolute scope, i.e. infinity. This generally results in the common subtle oxymoron "infinitely many," or an infinite number. Spinoza intuitively recognized the common con-fusion of this intrinsic polarity and preferred the term "numberless" rather than an infinite number or infinitely many. Infinity, in this sense, is therefore the dissolution of the boundary of number itself. It is the logical Emptiness of the relative world of quantitative form. And so taking number to the *omni* of infinity turns it into the non of the numberless or boundless.

The omni-non is the binary logic aspect of the interface of the absolute and relative. This common absolute-inversion from the ONE-ALL to the non, is the intuitive source and inspiration, I believe, of Leibniz's cosmic fascination with binary logic, leading to the invention of our modern computational infrastructure.

Laplace wrote:

> Leibniz saw in his binary arithmetic the image of Creation. ... He imagined the Unity represented God, and Zero the void; that the Supreme Being drew all beings from the void, just as unity and zero express all numbers in his system of numeration. This conception was so pleasing to Leibniz that he communicated it to the Jesuit, Grimaldi, president of the Chinese tribunal for mathematics, in the hope that this emblem of creation would convert the Emperor of China, who was very fond of the sciences ...

This polarity (which he saw in the emblem of polarity itself, the yin-yang symbol) between Unity and the void is that between the fullness and emptiness conceptions of the absolute; in nondual philosophy it is generally held that Emptiness is fullness and vice versa, as one. The void, Leibniz speaks of, however, is the immanent infinity of the rational zero, not the pre-rational concept of zero as negation, or immanence as regression.[i]* Indeed, the axis of the Rational numbers as well as the positive infinity of philosophical rationality, as we will see, has an implicit binary form, toggling between the origin-identity at *one* and the immanent infinity at *zero*. His idea, therefore, that "the Supreme Being drew all beings from the void" is echoed in our Cycle of Unity, where the 1 of finite unity is the interface (solidus/vinculum) of the I/T uni-axis of the ONE-one. (This will make sense only after absorbing the context of the appropriate section,[ii]* or upon reading this the second time. Such are the compromises imposed from the linearity of language.) Furthermore, this is the creation of the first unit-

[i]* See, The Holarchical Unfolding of Number and Operation, p306.

[ii]* See, The (Binary) Cycle of Unity, p254.

closure and primitive number 1 of pre-rational mathematics, from the ONE to the interface of the monadic one.

Often, therefore, to make this aspect of the absolute-relative interface explicit, it will be invoked with the term 'omni-non,' as in omni-non-locality or omni-non-directionality. We saw already how the idea of omni-locality is essentially identical with the idea of non-locality, given that a location necessitates a separation and exclusion from other locations which both the omni- and non- view negate. In other words, locality is an implicit polarity, and when this polarity is violated in either omni- or non- directions (affirmative or negative, respectively), we pass through the PAR and reach the identity of opposites underlying the concept as a whole. The omni-non simply recognizes the identity between the omni and the non at the absolute scope.

Con-Fusions at the Interface

As Ken Wilber shows, with his pre-trans fallacy—and as I have found repeatedly in my search for understanding—at the transition points between levels in the transcending-and-including holarchy of the embryogenesis of ideas, confusions can arise by failing to take into account a distinction in operation unconsciously at a deeper level. These deeper-level, implicit, or "pre-fused" differentiations, are easily equivocated across or conflated, causing constant confusion in their higher-level discussions. At the interfaces of conceptual embryogenesis, then, confusions arise by the ***con***flation of pre***fused*** distinctions. This specific kind of confusion will be denoted by the hyphenated term, con-fusion, so that we can draw them out more clearly as they arise. It is important to note also that one of the most common con-fusions in intellectual discourse is between the pre-rational and dualistic prefused distinction of the absolute and the relative scopes. We'll continue to see this in action, as we proceed to reconcile the past with the emergence of Nondual Rationalism.

THE VISION-LOGIC COORDINATE SYSTEM (VCS)

Imagination is more important than knowledge... —Albert Einstein

VISION-LOGIC INTERFACES: VISION-LOGIC AND BLIND-LOGIC

> *The artist was right all the time. Nature is conceptual.*
> — R. Buckminster Fuller

> *The artist is commanded by nature … to make the invisible world visible, much like the* ancient ascetics *who, through their uninterrupted prayers, brought about the* immersion *of the Eternal God into Man's temporally finite world.*
> — Ernst Fuchs

> *The combination of feeling and thought of high intensity leads to a higher form of inner life, difficult to define in ordinary language. Thus, in art we already find the first experiments in a language of the future. Art marches in the vanguard of inner evolution, anticipating the forms it is to assume tomorrow.* — P. D Ouspensky

Weaving a luminous tapestry from the ideas of ancient and modern philosophers; from the science of perception; from the art-work of children; and from scientific writings in physics and astronomy—Rudolf Arnheim's research[i] demonstrates that thinking itself (not merely visual experiences or thinking about art, for example) is inherently perceptual. This is convergent with the modern conception of evolutionary development and embryogenesis,[ii] as a transcend-and-include process, where the more primitive forms and functions, such as the senses found in the lower animals; sight, sound, taste, touch, and even the internal senses of the emotions,[iii] etc, are not merely *transcended*, but also *included* in the operations of the higher cognitive functions and rationality. Indeed, without sensation, and the memory functions (i.e. "mnemonic primitives") encoded therefrom in the symbiogenesis of subjectivity and objectivity, there could be no higher levels of conceptualization in human cognition.

[i] See Arnheim's *Visual Thinking*, for example.

[ii] Transcension-and-inclusion can also be seen as implicit in Haeckel's "biogenetic law," "ontogeny recapitulates phylogeny," which says that the ontogeny, or embryogenesis of an individual organism, recapitulates, or transcends-and-includes, its phylogeny, or its entire evolutionary history.

[iii] emotions being an inner form of sensation, as described by the neuroscientist Antonio Damasio

Arnheim shows that the modern dichotomy between thinking and "seeing," between reasoning and perceiving and between concept and percept, is patently false and deeply misleading and that even the fundamental mechanisms at work in the visual cortex involve processes typical of reasoning, such as the spontaneous distinction, comparison and sorting into the various *categories* of shapes, objects and effects in the visual field. Far from being merely a "lower" function, our perceptual/emotive/intuitive infrastructure—directly encoded with rationality through the intelligence of evolution interfacing with empirical reality—is the fundamental means by which we organize events, originate concepts and evolve our languages. Words themselves invoke perceptual, sensorial or emotive effects,[i] to the extent that they "make sense" at all to us. If we can't perceive it sensorially, intuitively or at least emotively (or even through the encoded memories of motor sensations), then we indeed find it difficult, if not impossible, to understand and really communicate. It is surely no coincidence that perceptual roots infuse our terms for understanding: "I *see*," "what a true *visionary*!" "ahh, that makes *sense*," "becoming en*light*ened," "a *bright* individual," "a *sound* judgment," "very *sensible*," etc.

Arnheim sums it up nicely in his Art and Visual Perception: A Psychology of the Creative Eye:

> We have neglected the gift of comprehending things through our senses. Concept is divorced from percept, and thought moves among abstractions. Our eyes have been reduced to instruments with which to identify and to measure; hence, we suffer a paucity of ideas that can be expressed in images and an incapacity to discover meaning in what we see. Naturally, we feel lost in the presence of objects that make sense only to undiluted vision, and we seek refuge in the more familiar medium of words. … The inborn capacity to understand through the eyes has been put to sleep and must be reawakened.

Arnheim's point, contrary to the interpretations of many of his critics, was not that perception, in itself, was the highest level of cognition,[ii] but merely (as the evidence clearly shows) that a training, or even a dabbling, in the arts—i.e. a "percept-training" where the senses are more effectively transcended-and-included (integrated) into the higher forms of abstract thinking—greatly enhances the ability to think conceptually. This is because, according to Arnheim, there is no real division between percept and concept. A training in the arts strengthens the very foundation of concepts themselves, the perceptual infrastructure of the imagination, the

[i] …even if diffused over many instances into a vague generality…

[ii] Which would be a rather "green-meme," or holarchy-demolishing interpretation.

engine of conceptual creation, which—as Einstein (one of the most creative of our mythic-scientist heroes) will advocate—is "more important than knowledge."[i]

Some commentators takes issue with Arnheim's focus on visual perception, at the expense of other modes. The leading-edge integral thinkers, however, conclude that the artistic, or aesthetic line is merely one of many simultaneously important lines of development, or intelligence. It is not my belief that Arnheim means to exclude the other senses, or intelligences in his focus on visual perception. It is likely, rather, that he merely finds vision the most interesting for his tastes, and perhaps the most useful for his research.

It is indeed well-known that primates, humans included, are primarily visual creatures (with perhaps more space in the brain actually devoted directly to visual perception, than any other perceptual modality), as far as the five or so external senses are concerned. There are good reasons for this. Vision has an extremely high "sensor density" or parallelism, coupled with a greater, more precise, aspect of directionality, than any of the other senses. Vision also has a very accurate near-/mid-range three-dimensional simultaneous resolution, and an impressive two-dimensional directional-resolution many light-years into the cosmos, as compared with the next closest in range, hearing, which is effective, really, only for many miles. Furthermore, take the retina—with its densely integrated, massively parallel frequency and intensity detectors (cones and rods, respectively)—and compare it with the cochlea; its frequency and intensity detectors are not integrated all together, in parallel, but arranged *linearly*, single-file, from lowest to highest frequency along a single spiraling line of cilia-hairs. There is thus an element of linearity to the audio channels, which is not present in the video, at least where spatial simultracking is concerned. Of the "five" senses, therefore, it would appear that vision is the most nonlinear, massively parallel and sensorially precise for the purpose of "simultracking," and interrelating (networking) many spatiotemporal phenomena at once.[ii]

This unique quality of vision is likely the reason for its inclusion in the term "vision-logic." Vision-logic is, in a sense, a meta-vision; it is taking the "networking" capacity of the visual sense and transposing or transcending-and-including it at a higher (meta-conceptual) level (e.g. the level of logic) in the networking of perspectives themselves. This is why it is also called "network logic." But with "vision" at the *meta*-level in "vision-logic," we are *not* excluding, but transcending-*and*-*including* the other senses and their training (and even creative listening or interpreting) modalities in the full

[i] There is a bit of ambiguity, however, regarding the distinction between percept and concept which will be cleared up in the section, Percept and Concept, p617.

[ii] The audio sense does, perhaps, a better job of this in the temporal, and emotive realms, but lacks the resolution in the *spatio*-temporal.

spectrum of the arts. Vision at this level, in a sense, simply means "percept," and so, accurately speaking, we might call this a "Percept-Logic Coordinate System," though this would lose the unique network connotations that vision-logic has come to embody.

Vision-logic, therefore—with its integrated concept-percepts—becomes opposed to "blind-logic," where "concept is divorced from percept, and thought moves among [mere] abstractions." Blind-logic has a limited, hollowed out, semantic foundation and so it lacks the ground[i] or medium within which to move, so to speak. Unable to find a ground within which to find subtle reconfigurations and variations, it is stuck in a single perspective. It can't, therefore, find new modes of "seeing" the whole. Blind-logic generally lacks the ability to lift itself out of the rooted perspective of mere words, syntax; it cannot escape the "word-binding" so common to abstract, sophistic, logic (e.g. lawyer talk) which can "prove" the "truth" of even the most obvious of absurd conclusions; thought, such as this, easily becomes "spell-bound" to its surface-level machinations, as does its unwitting audience.

Because of the above properties—with respect to primate, and especially human cognition—vision is uniquely suited to enhancing, solidifying and expanding conceptual and theoretical or cognitive work. This is why we find the use of diagrams so helpful in academia and industry, such as in scientific and medical visualization, which can allow the researchers and practitioners to get a simultaneous, intuitive view of the whole—a new perspective, from which so many new aspects can come to light. It is also a quick way to communicate an idea. Audio aids, such as rendering out mathematical or data curves as audio forms, can give a good *feel* for such things as temporal relations, sequencing and harmonics, but they are being used less often than visual stimuli; animation, imagery and now virtual worlds.

Again, this is not to exclude the other senses, but merely to compare and contrast their strengths and weaknesses, their lines, as opposed to their levels, of evolutionary intelligence, as it were. And to be sure, we are neglecting in this work, as Arnheim has done in his, to build the case for the other senses; a task which would be extremely valuable for the project of rationality in general, and for the evolution of knowledge as a whole, because we know, for example, that some of the greatest theoretical thinkers were practicing musicians and composers, rather than visual artists. Clearly the acoustic-temporal-emotive percept-concepts that training in music (or even intently listening to it) cultivates cannot be underestimated.

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[i] An instance of the Deleuzian "plane of immanence."

So what is a vision-logic interface? In this model there is a running theme about polarities and the triune interfaces between them, unifying the dualities and dichotomies through acknowledging and empowering the common forces that separate and unite them. But the whole model itself is an interface between the imagination and the many percept-void "modern," "post-modern" and "post-post-modern" abstractions; a sensorial interface infusing the dichotomies and paradoxes with a deeper context for meaning and resolution; between the finite and the infinite, between the discrete and continuous, the local and omni-local, freedom and determinism, etc. A vision-logic interface is a visceral connection, through imagery (or any other sense), objects or animation (verbalized or technologically rendered), and critically, between aperspectival (vision-logic level) logic/insight and the imagination of the writer and viewer.

The aim of vision-logic interfaces, such as the Vision-Logic Coordinate System, is to reconnect concept and percept; to reawaken the "eyes" of modern thought which have been put to sleep by the paucity of sense in intellectual abstraction; to reinvigorate the anemic, disfigured forces of imagination in modern intellectual discourse. This is what Buckminster calls for in his idea of a "return to modelability" in geometry, mathematics and ultimately science. Indeed Fuller's oft-used term "conceptuality" explicitly refers to concept inclusive of percept and the critical, exploratory forces of the imagination. He says in *Synergetics: Explorations in the Geometry of Thinking* [[my comments and ***emphases***]]:

> The greatest of all the faculties is the ability of the imagination to formulate conceptually. ... The artist was right all the time. Nature is conceptual. ... Conceptuality requires the generalization of patterns gleaned from special-case experiences ***[[percepts]]*** and thus defines the basic event experiences that constitute structure. We may think conceptually of assemblies of triangles or basic, generalized, structural arrangements that will hold true at either an atomic-nucleus size or a super-galaxy size, because all angularly defined systems are conceptually independent of the relative sizes of special-case experiences (section 501).

This was Fuller's aim, to which we are fully sympathetic: to reconnect the "cultural chasm" between the humanities and the scientists which C.P. Snow had earlier identified. The surreal, or lucid artist, Roberto Matta had a similar direction, intuition and aim to that of Arnheim, Fuller, myself and others, (if perhaps more intuitive, poetic, nonlinear and difficult to grasp), in what he calls "morphological psychology." He says [[my interpretive attempt and ***emphases***]]:

> In the area of consciousness, a morphological psychology would be the diagram of ideas. It should be conceived ***before*** optical images may give us the form of ideas [[e.g. a meta-system]] if we want to stay in the

> transforming medium [[the vision-logic level of cognition, open to all sensorial/conceptual integration]]. The optical image is only a theoretical section within the morphological fall of the object [[images, in themselves, are flat or 2d, and only working in a single perceptual mode, vision, in an ultimately n-dimensional, n-sensorial/-conceptual-synaesthetic mental-space]]. … Reality is the sequence of the explosive convulsions modeled in a pulsatile and rotative medium exposed to rhythms. The eye as the agent of memory [[percepts as "mnemonic primitives" [i]*]] is a means to simplify. … Without a vision from the eye, any representation stays blind. And the reasoning that follows stays insufficient, impotent.

Terrance McKenna, in an *Omni* interview, also gives us a poetic rendering, but focusing more on the possibilities of the evolution of vision-logic and language (or "vision-language") itself.[ii] This DMT-induced[iii] vision is similar to ones I have personally experienced, where (as far as is describable in words) vast meaning, which would normally engulf the thinker in conceptual complexity, becomes condensed into visual objects outside the subject. These objects then become capable of a higher level rapid motion, transformation and assembly into larger and larger integrated concept-percepts. McKenna says [[my comments]]:

> They are teaching something. Theirs is a higher dimensional language that condenses as a visible syntax. For us, syntax is the structure of meaning; meaning is something heard or felt. In this world, syntax is something you see. There, the boundless meanings of language cause it to overflow the normal audio channels and enter the visual channels [[back to its powerful sensorial roots and foundations]]. They come bouncing, hopping toward you, and then it's like—all this is metaphor; they don't have arms—it's as though they reach into their intestines and offer you something. They offer you an object so beautiful, so intricately wrought, so something else that cannot be said in English, that just gazing on this thing, you realize such an object is impossible. … The object generates other objects, and it's all happening in a scene of wild merriment and confusion.

[i]* See Emergence, Mnemonic Primitives, and the Symbiogenesis of Subject and Object, p528.

[ii] See S. Lem's *Imaginary Magnitude*, for a fantastic discussion on the possibility of "meta-languages," complete with a diagram of a future evolutionary-linguistic scenario.

[iii] DMT, or dimethyltryptamine, is classified as an "entheogen," similar to other drugs that induce "religious" or mystical visions of a unity (or vast plurality) with God or the cosmos.

THE PLANE OF IMMANENCE

Deleuze's concept of "the plane of immanence" describes the *distinctive* conceptual, intuitive and semantic foundation underlying each and every philosophical system. This "plane," unique for each system, like Arnheim's realm of percepts, exists beneath (immanent to) the level of words and categories, and the words and categories are only mapped *a posteriori* to this plane (though they each feed into the evolution of the other). This connection, between the systemic-map and the plane of immanence, functions in such a way that two systems can share the same general plane of immanence (basically semantics) while appearing, at the level of words (basically syntax), entirely opposed. The superficial difference, in these cases, is due solely to the respective differences in the mapping of critical words to the same general plane, and it has caused countless arguments over what later become seen as purely nominal distinctions, supposing the participants are lucky enough to see it at all.

Deleuze and Guattari give a tantalizing account of this concept in their final collaboration, *What is Philosophy?*.

> Concepts are like multiple waves, rising and falling, but the plane of immanence is the single wave that rolls them up and unrolls them. … Concepts are the archipelago or skeletal frame, a spinal column rather than a skull, whereas the plane is the breath that suffuses the separate parts. Concepts are absolute surfaces or volumes, formless and fragmentary, whereas the plane is the formless, unlimited absolute, neither surface nor volume but always fractal. Concepts are concrete assemblages, like the configurations of a machine, but the plane is the abstract machine of which these assemblages are the working parts.

Though we could undertake this project using Deleuze's notion of a plane of immanence we find this metaphor literally too flat (or transitive) in its connotations and too simplistic and vague in its conception to function adequately. Therefore, we transcend-and-include this plane of immanence[i] into a Vision-Logic Coordinate System with not only *planes* of immanence, but, among other details, an endless *axis* of immanence, a rootless-root, a deep infinity, upon which the planes (as transitive modalities) emerge and submerge, evolve and involve, unfold and enfold.

[i] …not to suggest an actual genealogy of the conception itself from Deleuze's plane of immanence, but merely a conceptual unfolding for this current explication.

Though of course it is obvious from the above quote that the plane of immanence is not really a "plane" at all, but something much more alive and complex, a "fractal…abstract machine" with "assemblages" and "working parts," an embryogenesis, prior to the concept, sub-representation, if you will. In this sense the VCS is, or includes, the plane of immanence, though as a service to the concept itself, we abandon the term "plane" in general, and delineate the working parts, the "anatomy, physiology and embryology,"[i] of this abstract machine in more dimensions than a "plane" will connotatively allow.

[i] To quote the first part of Gerald Lebau's acronym, ANPHEON, "the **an**atomy, **ph**ysiology and **e**mbryology **o**f **N**ature".

THE VCS: BREAKING AWAY FROM THE PLANE OF IMMANENCE

> *Miserable mind, you get your information from your senses, and do you try to overthrow them? The overthrow will be your downfall.*
>
> — Democritus

"Vision-logic," a term borrowed from developmental psychology, denotes a stage in intellectual development, a "meta-vision" whereby one can transcend the limits of singular perspective and attain an understanding, simultracking, integrating many perspectives at once, i.e. "integral-aperspectival." It is also called "network logic," in the sense that it can actually begin to make networks of perspectives; moving among them, forming comparisons, higher-level systems of inter-perspective translation, co-operation and conjunction, integrating and transcending.

As Ken Wilber states in *A Brief History of Everything*, vision-logic is "the capacity for taking multiple perspectives and then integrating them to some degree. Unlike formal operational thinking, which *tends* to be single perspective, abstract-formal, and monological …, vision-logic is postformal and 'integral-aperspectival' (p191)" A loose analogy can be drawn with the difference between the limitations of a painter vs. those of a sculptor. The painter must represent his vision from a single perspective (or a fractured perspective if he is a cubist), but always onto a flat plane. The sculptor, on the other hand, can execute his vision in three dimensions, view it from any angle he wishes and effectively work in them all simultaneously because he is operating volumetrically rather than merely on a flat plane.

Now expand this analogy further (nearly transforming it beyond recognition), and imagine that the sculptor can shrink into his own creation and inhabit the various nooks and crannies and that eventually he settles down in one location and lives out his long life even perhaps forgetting about the sculpture as a whole and coming to believe that this one viewpoint and its visible landscape is the sole design.[i]

[i] This is similar to Phillip K. Dick's conception of God, getting lost in his own creation…and it is ironically similar to the role of the author, as I am right now lost inside this creation as I create it.

A Vision-Logic Coordinate System serves the function of uprooting such a provincial inhabitation allowing the territory to again become an object of perception as a whole in the mind, with the capacity to descend and ascend at will to see the whole object/system from various vantage points in a higher-dimensional space. The VCS serves the function of visualizing and coordinating conceptual relationships (networks) free from a singular rooted perspective, and at the vision-logic, or integral-aperspectival level of cognition which, as Ken Wilber states in his A Brief History of Everything, "synthesizes, integrates, and sees networks" between otherwise opposing systems, rather than being rooted defensively and offensively within any of them.

This may seem a daunting and unrealistic task, but it is actually quite simple, taken step by step. And, with the help of language, we will bootstrap this conceptual and inter-dimensional space from the 2D frame of this paper (or computer screen). The flat diagrams and linear text will suggest to the mind the intuitive, non-linear and aperspectival forms, the plane of immanence, from which they were derived. These emergent (non-platonic) forms are to be used loosely, intuitively and organically, as orienting generalizations from the aperspectival vision-logic level of cognition.

It must be pointed out again, at this point, that in harmony with the Deleuzean definition of philosophy as an essentially creative act, this system itself is purely imaginary, and indeed a synthetic and even an *aesthetic* creation; a toy demi-mythology; Philosophy as the art and play of the concept. This system does not claim existence for itself outside the mind or the paper. As in Buddhism, in this demi-mythology of an imagined world of ordinary concepts, an enlightened man is more powerful than any of its would-be gods, and one must always be on the look out for any enslavement by these concept-gods (platonic forms), as well as ways to transcend them (negating if necessary, but including if possible).

The system is not conceived as a 'pure' platonic form preexisting all human thought and action that must descend into impure materiality. But it does indeed map—in the general and abstract way of all maps—a deeper and vastly more complex emergent territory beyond itself; A dynamic reality of conceptual attractors, dimensions, drives and motions, pushing and pulling the mind in these abstract intuited directions which are only mapped *a posteriori*, and even empirically, to the artificial geometries (points, boundaries, axes and planes) and concepts of the system.[i] These basic

[i] This is the essence of Deleuze's conception of Empiricism, an intensely creative and conceptual endeavor coupled always and ultimately with immanent and causal explanations of emergent and sensate reality. That is why he considered Spinoza one of the key empiricists, as opposed to Descartes who imposed his system from the outside, from the limitations of his own mind, rather than recognizing the limits of the mind to grasp the immanent capabilities of matter to be at one with mind as aspects, or attributes, of a single immanent causal reality.

emergent directionalities of thought, can be found in virtually all philosophical systems, and in the hidden structure of mathematics itself[i] and they are essential for the task ahead, as we will see.

[i]* See the section on Part Two: Interface Mathematics, p200.

THE TWO VL- AXES: IMMANENT/TRANSCENDENT AND TRANSITIVE

> *When this, the subjective, and that, the objective, are both without their correlates, that is the very axis of Tao. And when that axis passes through the center at which all infinities converge, affirmations and denials alike blend into the infinite ONE. Hence it is said that there is nothing like using the light.*
>
> — Alan Watts, *The Wisdom of the Ridiculous*

In the embryogenesis of the concept, the ineffable absolute breaks into the relation of cognitive operation [i] first in the polarity of the Immanent/Transcendent axis and then in the orthogonal transitive axes. In this vision-logic meta-system, then, we have only two main "axes," "vision-logic axes" or "VL-axes" which are conceptual forms of directionality as a pre-operational context for the operations of mathematics itself. Because we have only two VL-axes in mathematics there is an underlying binary form to mathematics, and it manifests into various cycles between zero and one, as we will see. These VL-axes are the immanent/transcendent (I/T) and the transitive, and, as we will see, they correspond roughly to Cantor's uncountable and countable infinities.[ii]* Unlike the axes of the Cartesian system, the orthogonality between these VL-axes is not really perpendicular, and the VL-axes are merely forms or concepts of directionality, of motion, and not necessarily linear, as we will see. They are often, however, *necessarily represented* merely "on paper" as linear and perpendicular axes, such as in the main diagram of the VCS which we will encounter below, and doing so can be very beneficial, so long as their real nonlinear and non-rectilinear nature is kept in mind. So the term 'VL-axis' can function by operationalizing a polarity, and invoking the diagram and the differentiating orthogonality represented therein, rather than forcing the mind to conceive of each of these directional concepts as uni-directional and perpendicular linearities. Viewing them as single linear axes would collapse the system to the merely transitive, as we will see.

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[i] A conceptual "symmetry breaking"

[ii]* See To Infinity and Beyond: Tuning and Triuning the Paradox (p432) and its subsections Galileo, Cantor and the Transfinite (p442), and Back to Zeno (p448).

It is best to imagine these VL-axes as being *abstracted from* the absolute infinite as mere concepts or "directional aspects" of the infinite (aspect infinities[i]), rather than *constructed* from the finite as indefinitely expanding sequences. These VL-axes, or conceptual directionalities, are roughly and respectively the singular omni-directional in/out polarity (I/T axis)—the "axis" opened up in the rational numbers, as we have already seen—and the infinite uni-directional polarities, often collectively called the "transitive axis."[ii]

The quickest way to verbalize this distinction is through a common mathematical example which we will explore below. We will start with the transitive axes (uni-directions, and each one of itself a typical axis) since they are the most familiar and indeed the birth-place of organized thought in polarity, opposition and relativity, but it is the immanent/transcendent omni-directional VL-axis which is primary, before thought and number, and from which the transitive axes naturally "exfoliate" and find their reference before mathematical operations can even begin.

The polymath and "visionary" R. Buckminster Fuller, in his Synergetic Geometry renders in spectacular relief the idea, which Interface Mathematics expands still further, that the development of mathematics (from the transitive to the immanent) occurred in reverse order to the hidden order of the system (from immanent-transcendent to transitive operation and back to immanent-transcendent). As Bucky relates in his historic 36 hour lecture, *Everything I Know*:

> I was really so terribly impressed when I was a kid by the fact that whereas chemistry was always … associating and disassociating in beautiful, whole rational numbers, physics was always coming out with irrational numbers. And I felt that what was really causing it was that we were really using yardsticks that were not the logical yardsticks—that we came in the attic window and were trying to measure all the rest of the windows by the attic window or something….But it was a flat earth anyway so you might as well plan on cubes, and that's the way to divide the Universe. The minute you get into the spherical you're going to realize that they [the cubes] are not going to work very nice…

It is the immanent-transcendent axis of volumetric, omni-directional, radial expansion/contraction, we will find, that is essentially the primary axis of his exquisite geometric, intrinsically rational and trans-"Rational" dimensioning system, and indeed, the primary VL-axis in the Vision-Logic Coordinate System and Interface Mathematics and Philosophy.

Fuller followed this notion to its exquisite culmination in his Synergetic Geometry, which Interface Mathematics effectively serves, among many

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[i] This is the essence of the concept of the "Aspect Infinite," which is the 2nd order infinite, found in Spinoza's Triune Infinite, p270.

[ii] True to the Tao, the omni (infinite) is singular and the singular is omni (infinite) — ALL is ONE.

other things, as a conceptual bridge and meta-mathematical context for. Unfortunately the vast details, important benefits and utter beauty of this fascinating geometrical system will have to remain beyond the scope of this book.

The Transitive Axes: In Through the "Attic Window"

Picture the sequence of integers on the familiar Cartesian coordinate system. It extends infinitely up and down the scale, in both positive and negative directions. Between any two numbers there is always a finite and discrete (quantized) number of *integer* coordinates to be found. This intrinsic finity (boundedness), within an extrinsic or indefinitely extending positive and negative infinity, is the defining feature of the transitive VL-axis, and it arises as a function of the inherent *quantized* and composite *uni-linear* nature of this level of the system. This is also what gives the transitive-axis its "countable" nature, as we will see, as opposed to the uncountability of the infinity of the Immanent/Transcendent axis.

These are the two main elements of the transitive: its *uni*-linearity and its quantized, or discrete nature. Each of the two main elements, uni-linearity and quantization, alone, is enough to denote the transitive quality. The transitive axis only gets into continuity when it begins to move into operation on the immanent-transcendent axis, such as in the real number line, as we have seen with the labyrinth of the continuum opened up first in the rational numbers. But it is critical to note that any line is transitive, even if it has elements within it derived from immanent-transcendent operations. The Cartesian axes, then, even though they can represent the rational numbers, are intrinsically transitive-axes, because they are a composite of linear dimensions.

The category, *transitive*, includes any of an "infinite number"[i] of dimensions as a ***linear*** direction, as seen from any possible fixed scale of reference; from any fixed unit, even if that fixed unit is opened to deeper levels of immanence by the "violation of the closure property" in the mathematical ratio. If the axis is linear, it's transitive, and a single transitive axis is simply an axis, whereas the transitive-axes taken together are called the transitive-axis, which is a VL-axis in orthogonal opposition to the immanent/transcendent VL-axis. However, the VL-axes, used with their descriptors (e.g. immanent/transcendent or transitive) won't require the VL- tag at the beginning, so long as we remember that these are pre-

[i] Or "numberless," as Spinoza might say, to avoid the oxymoronic pitfalls that befall us when thinking of the infinite in terms of a number, or the finite.

operational and pre-mathematical axes, at the vision-logic level of the meta-paradigm.

The Cartesian coordinate system, is the traditional embodiment of the transitive axes, but they can be oriented and/or skewed into any single, or multiple set, of directions imaginable. Thus the transitive axes, each taken separately, are ***uni-directional***, but they operate *within* an "omni-directional" or even a "non-directional" space.[i] This is in opposition to the immanent-transcendent axis which, in a sense, IS the omnidirectional, and indeed the "omnidimensional" space, within which the transitive uni-directions, or uni-dimensions, operate—exfoliating from, and always in reference to, a specific location on the I/T axis. This will become much clearer as we proceed.

The Immanent/Transcendent Axis

> *The intersection of the macro universe and the micro universe will create a gate, or a door. Lao tzu called this "the door to all wonders". This is where yin and yang merge harmoniously. This is also called the Middle Way.* — Henry Chang

In my adolescence, I had an abstract dream of a "disembodied flight" across a ticking strip of "acoustic ridges," like a pull-string for interfacing and accelerating the gear system of a toy car. At every crossing of a ridge of the strip, I would hear and feel very distinct … *TICK* … and another … TICK … TICK, TICK, TICK, ||||||||||||… . As I continued my bodiless travel along this linear, acoustic and tactile axis of ticking units, the pattern soon became tedious, monotonous, overwhelming. I quickly developed a trick: I began to skip units, to expand awareness up and out, and then down and inward, at will. I began to see patterned regions on the infinite line, places to which I would jump, connecting and collecting organizations—organisms, forming and informing an emerging whole.[ii]

This strange little dream, typical of the abstraction of many of my oneironautic[iii] escapades, gave rise to the idea in my early philosophy, of "the unit as the collapsible scale." This concept of scales as expanding and collapsing endlessly to and from their units, "a doorway into the identity of

[i] …invoking the Principle of Absolute Reversal to invoke the identical opposite, omni=non.

[ii] Interestingly, this was also the period in my life when I was experimenting with the interface between tedium and excitement, or repetition and difference in music.

[iii] "Oneirology is the scientific study of dreams. The term comes from the Greek *oneiro* which means dream." An *oneironaut*, then, is a creative practitioner, or explorer of dreams.

within and without," as I called it, was an early anticipation of the concept of the holon, the "part-whole," which had been invented decades earlier by Arthur Koestler, but about which I was ignorant. This simple idea—that every unit is a collapsible and expandable scale, the very environment of deeper, "collapsed" units, (or every *part* is a whole) and its corollary that every scale is collapsible to, or expandable from, a unit (or every *whole* is a part)—necessitates an "endless holarchy" of collapsible/expandable unit-scales.

When reading over my old notes, I found it fascinating that this transition from the transitive "ticker-line" to the immanent-transcendent holonic axis, or the "scalaxis,"[i] as I originally called it, was directly enacted, and indeed discovered in this simple little dream. In retrospect, it seems but a vivid reenactment of Zeno's hypnotic brand of toys—which themselves break into the fundamental binary VL-axes of conceptual relation—but used as a seed for my wanderings in the conceptual space of the new biological genome. I include it here for a nice little diversion into dreamland, perhaps providing a self-similar historical echo, and a convenient segue; an intuitive bridge from the transitive to the immanent-transcendent dimensions in an infinite holarchy of unit-scales.[ii]

As we have seen in the prolegomena (and in the Principle of Nondual Rationalism), the Immanent/Transcendent axis is first operationally accessed *in mathematics* with the "violation of the closure property" of the integers in the function of the mathematical ratio culminating in the notion of a continuous numberline. But it is the evolution of the immanent operations of the calculus, or perhaps the trans-rational escape into immanence in the "irrational" (or wholly rational)[iii] and transcendental numbers which define the most salient mathematical aspect of nondual-rational philosophy, as opposed to the transitive, dual/oppositional (positive-negative) Cartesian coordinate-system, which mirrors the surface-level, relative-bound, proto-rationality, dualism and transitivity of the Cartesian philosophy.

As we have also seen, *a priori* continuity is the essence of the immanent-transcendent axis, because continuity entails infinite divisibility, and, as Nondual Rationalism demonstrates, division is the first mathematical

[i] With the adjective form, 'scalactic' having a nice sci-fi ring to it.

[ii] One of the motivations for using the term immanent-transcendent axis, rather than 'scalaxis,' is that operationalizing the idea of 'transcendence' as a common, and fundamental aspect of reality, will help bring it "down to earth", so to speak, and help reconcile the transcendent-bias, and immanent-transcendent dualism infecting pre-rational modernity (and post-post whatever).

[iii] …and here we find yet again a transcendent-bias in that immanent boundless numbers are "irrational" and transcendental numbers are merely transcendental.

operation on the immanent/transcendent (I/T) axis.[i] The I/T axis is, very roughly, the mapping of this immanent and transcendent infinity as a continuous "axis of scale," between the *omni-directional* concepts of "infinite smallness" (immanence or yin), and "infinite largeness" (transcendence or yang), neither of which terminate (being infinite and unbounded) at any final level.

The I/T axis is the *axis mundi*, or world axis of esoteric philosophy. It is the axis between the micro and the macro universe. We encounter the I/T axis and its polarity (as well as the concept of involution and evolution, to be explored later)[ii]* in the following quote from Plotinus, "there is nothing transcendent that is not also immanent," and in this aphorism from Heraclitus, "The way up is the way down, the way down is the way up." The I/T axis has been implicit throughout recorded history in one form or another. As Karin Verelst demonstrates—in her article *Some remarks on the relation between the microcosmical and macrocosmical instantiations of the mythological World-Axis*—the axis mundi is found virtually throughout all religions and philosophies of the world. In the trinity of Western religions, Judaism, Islam and Christianity it is generally symbolized as a tree, such as the trees of life and good and evil, as well as the Kaballistic Tree of the Sephiroth. It is also found in the East, in the religions of India, China and Indochina. In Taoism, for example, it is known as "the door to all wonders," and in ancient Mesoamerica it is symbolized in the form of a mountain, for example the Mayan sacred mountain *Mixik Balamil* at Zinacantan.

Take the following quote from the *Corpus Hermeticum* of the 3rd Century, "God is an intelligible sphere whose center is everywhere and whose circumference nowhere."[iii] And the I/T axis is found in tetrahedral or systematic-structural form in Buckminster Fuller's idea of the "Omnidirectional Halo" which he describes thus, "The difference between nonconceptual, nonsimultaneous Universe and *thinkability* is always two tetrahedra: one as macro, to complete the convex localness outside the system, and one as micro, to complete the concave localness inside the system, to add up to finite but nonconceptual Universe."

It must again be emphasized that despite the linear connotations of the word "axis," and the necessary linearity of some of the vision-logic renderings (or interfaces), the I/T "axis" is not properly conceived as linear or uni-directional at all, but rather is ***inherently omnidirectional***. The I/T

[i] And here we see the age-old dichotomy between the continuous and the discrete embodied as the distinction between the two conceptual directionalities in the VCS.

[ii]* See, Evolution is Involution Seen in Reverse, p580.

[iii] Notice the modal-centric emphasis on locality, as in the center is everywhere. The law of absolute reversal requires that this polarity be switched to operationalize its inverse. It then becomes "God is an intelligible sphere whose center is nowhere and whose circumference everywhere." It works from either an inward or an outward perspective.

axis is an axial representation of the unbounded polarity of volumetric, or geometric expansion or contraction (see Figure 6, below).

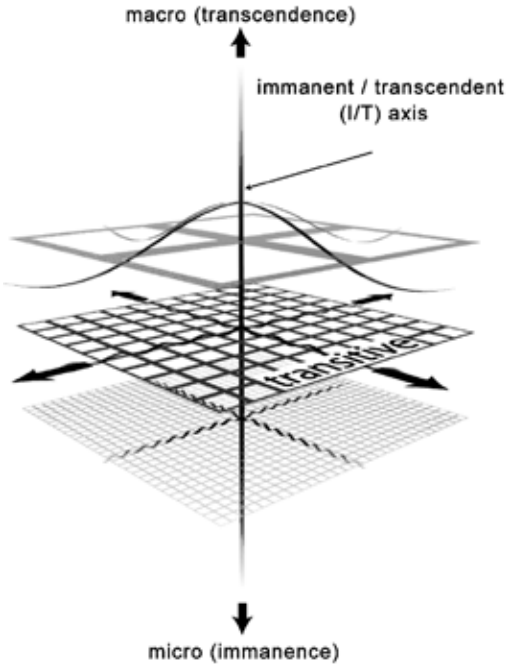

Figure 6: The Main VCS Diagram: This diagram is perhaps the simplest of the many ways to represent the distinction between the immanent and transitive axes, but it is critical to note that the diagram flattens the dimensionality of the transitive space into planes in order to represent the I/T axis uni-directionally. The omni- and non-directionality of the I/T "axis" is here drawn, unfortunately but necessarily, as a linear "axis" rather than an inherently volumetric, spherically coordinated polarity.

In the figure above, the I/T axis is drawn, unfortunately but necessarily, as a linear, unidirectional, "axis" rather than an omni-directional expansion or contraction. The transcendent "direction" on this axis zooms outward from any "position" (fixed volumetric scale) on the I/T axis and the immanent "direction" zooms inward. The familiar 3-dimensions, *xyz* and all infinite uni-directions in-between, have been collapsed—for the sake of higher-level, aperspectival, visualization—into the transitive plane fixed upon the central I/T axis. Also note that the orthogonality between these VL-axes is represented by perpendicularity, which is also entirely misleading. Perpendicularity is simply the easiest and most direct way to visualize orthogonality. The orthogonality between these two VL-axes, however, is best understood as a scale invariance between transitive relations. In other words, in a system of transitive relations, such as any mathematical geometry (or self-similarity), if you change the scale itself (changing coordinates on the I/T axis) the pattern of relations will always remain the same.

The crucial function of this diagram is to demonstrate the relation between transitive planes as fixed with respect to specific positions on the

Immanent/Transcendent axis, and that these "positions" correlate in this higher-dimensional interface, not to position itself, but to size or scale. But it is more crucial, when needed, to be able to forget the unfortunate flatness of the transitive axes and planes, and the linearity of the immanent-transcendent axis in this rendering. We will see a more accurate rendering below of this critical distinction which, when used in conjunction, will help us recall the omni-directionality and continuity of the immanent axis, vs. the linearity of the transitive and that the transitive axis always functions from a fixed frame of reference.

The crucial point here is that the transitive axes regularly collapse (or instantaneously manifest) the immanent/transcendent infinities, as Zeno demonstrated, otherwise any distance between two points would be infinite, and the hare could never overtake the tortoise, nor the arrow reach its mark, since there are an "infinite number" of "infinitely small" intervals to cross between them.[i]

The most crucial distinction between the I/T axis and the transitive polarities is that the I/T axis deals exclusively with *a priori* volumetric omni-directionality, inward-and-outward, and the transitive axes are exclusively unidirectional abstractions, such as the 3 uni-directions that make up Cartesian coordinate space.

Coordinates on the Immanent-Transcendent Axis

> *When one dives into endlessness, in both time and space, farther and farther without stopping, one needs fixed points or milestones past which one speeds. Without these, one's movement does not differ from standing still. There must be stars along which one shoots, beacons from which one can measure the road covered. … He must divide his universe in distances of a specific length, in compartments that repeat themselves in endless series.* — M.C. Escher, *Approaches to Infinity*

A quick look at coordinates on the I/T and transitive axes will help make the distinction clear. To aid in representation, we can use an enclosing surface, a sphere (see Figure 7, below), representing or embodying the particular volumetric scale. This sphere is *a coordinate*, on the I/T axis; a fixed scale

[i] It is clear, however, that an infinitely small distance, were it not a contradiction in terms, would take zero time to cross, which we will explore in greater detail in Interface Mathematics.

which is inherent to (unfolding as) the particular transitive axes, represented as a plane on the main VCS diagram (above).[i] And so even the rational and continuous numberline, such as that drawn on a Cartesian graph (or any of the single lines passing through the infinity within the I/T axis below), is, in a sense, merely a uni-directional, or transitive, cross-section or rendering of the spherical/omni-directional I/T axis.

[i] …and as we will see, the sphere is the most general representation of number, in identical opposition to this same immanent-transcendent axis (the identical opposite of number), The Infinite.

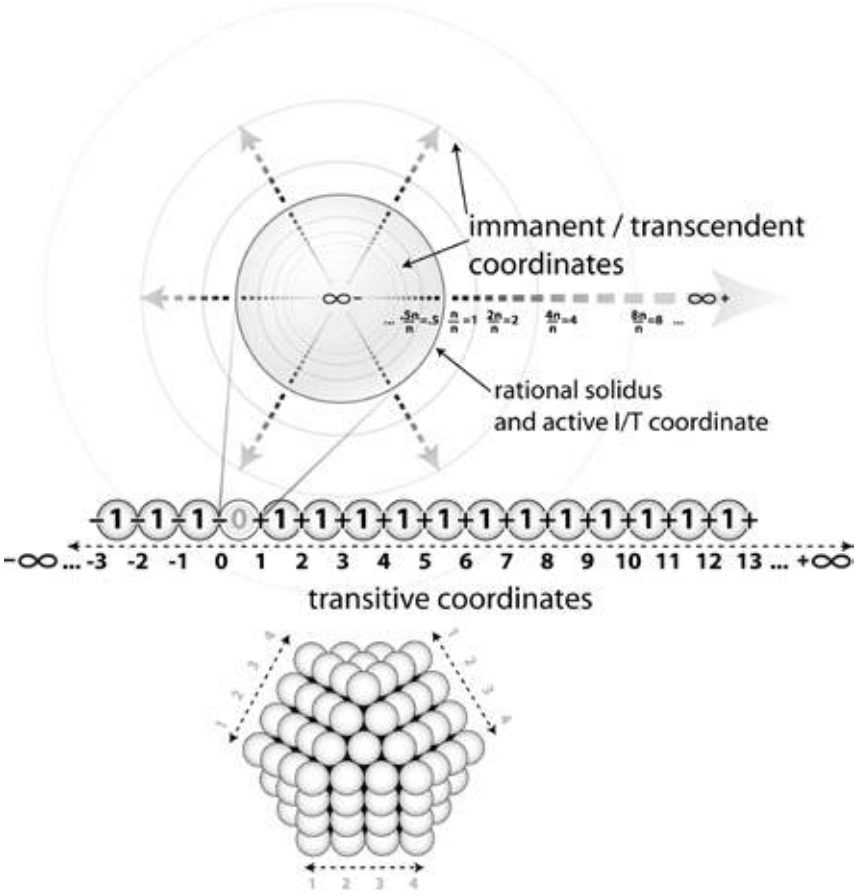
immanent / transcendent
coordinates
rational solidus
and active I/T coordinate
-∞ ... -3 -2 -1 0 1 2 3 4 5 6 7 8 9 10 11 12 13 ... +∞
transitive coordinates

Figure 7: The Nuclear VCS Diagram With Coordinates:
This diagram is from Part Two: Interface Mathematics (p200) section later in this book, so some of the notation may be a bit unfamiliar, but it offers another way of visualizing the difference between the I/T and transitive axes. The I/T axis represents the infinite omni-directional aspect of scale and the transitive represents the uni-directional axes of measurable distance.

On the immanent-transcendent axis, coordinates (i.e. "positions" *on the representational axis*, not necessarily in space itself) denote inherently *spherical* or *volumetric* differences, as degrees of omnidirectional expansion and contraction, of the "spherical coordinate," regardless of real-world position. In other words, ***the position on the immanent-transcendent axis does not represent spatial position***. It represents scale, denoted by the variable size of the sphere (see above), which itself is the representation of the actual coordinate in "immanent-transcendent space." This "immanent-

transcendent space" (a space of "intensive forces," as Deleuze might say) is merely mapped abstractly, as a visual aid, by the linearity of a transitive axis, as in the main VCS diagram (see Figure 6, two figures above, p141).

This *omnidirectional* expansion and contraction inherent to the immanent-transcendent axis, is opposed to the *linear, unidirectional* movement from position to position, number to number, on the transitive axes, where changes in position on the axes correlate, often directly, to actual changes in space.[i]

The coordinates on the transitive axes are fundamentally composed of quantized finite unities or unit-spheres, and merely abstracted as infinitely-precise positions (implicit singularities) with no volumetric extension whatsoever. This is very loosely analogous to the difference between scalars (magnitudes) and vectors (directions), except that scalars are represented as a function of abstract magnitude and the I/T axis maps the polarity of *volumetric scale* itself as magnitude.

I/T Omni- and Uni-axes

The immanent-transcendent axis, can be further analyzed, delineated and differentiated, into ONE *omni-axis* which is composed of an "infinite number" (or the numberless ALL) of *uni-axes*; this is the univocal ONE-ALL relation, as we will see.[ii]* The omni-axis is best demonstrated mathematically as a "Zenonian binary tree and semi-lattice," as shown by Karin Verelst in her paper, *Zeno's Paradoxes. A Cardinal Problem: I. On Zenonian Plurality*, and as we explore in great depth later.[iii]* In this paper Verelst demonstrates that this "simultaneous 'through and through' division"—what we are calling the omni-axis—is identical to Cantor's uncountable infinite and the cardinality of the transrational continuum—and thus it is the conceptual incarnation of our PNDR.

The uni-axis is the I/T axis as we have already seen it in the Nuclear VCS Diagram above. ***The uni-axis is always centered on a single position***, whose "infinitely small" Euclidean point is its unbounded immanent pole, and whose transcendent pole "reaches to" the unreachable transcendent infinity of the ONE-ALL. The uni-axis, therefore, is always conceived through the relative aspect of position or finite locality (relative to any *other*) and, therefore, ultimately through the "eye" or aperture (boundary or spherical "yard-stick") of the transitive unit i.e. the spherical coordinate making up the

[i] Note that we are not concerned here with the use of transitive axes to represent non-spatial, or non-physical aspects, at this point, except for the representational use of the transitive-axis to stand for the immanent-transcendent axis in the main Vision-Logic Coordinate System diagram (two figures above).

[ii]* See, for example, The Univocity Framework (UF), p153.

[iii]* See, Back to Zeno, p448.

linear directionality of the transitive-axis.[i]* The I/T uni-axis is the immanent and transcendent, internal and external boundless dimension of this spherical, *a priori*-extended unit.[ii]*

Conversely, the immanent-transcendent omni-axis (or just the "omni-axis" as we will often call it) enfolds into its concept the *labyrinth of the continuum* of extension itself, and all of its "infinitely infinite" positions; EVERY conceivable and inconceivable, rational and trans-rational location—each one of which is the immanent pole of a *uni*-axis. ***The omni-axis, then, contains all, or omni-, of the uni-axes.*** This omni-axis, therefore, "is an [abstract] sphere whose center is everywhere and whose circumference is nowhere."[iii]

The omni-axis can be seen as the abstracted and generalized essence of the ancient esoteric anima-mundi (or world soul), with its ONE as ALL, whereas the uni-axis can perhaps be seen more as the axis-mundi of the I/T axis in general, with its ONE vs. its one implicit singularity and immanent pole.

I/T Interfaces, the Omni-Uni and the Omni-Non

Because the immanent pole of each uni-axis represents an "infinitely small" Euclidean point, or an implicit "singularity,"[iv] it is thus the identical opposite of extension and continuity itself. It is therefore the non-extension of the abstracted immanent *aspect* of infinitely precise locality. This is why the labyrinth of the continuum itself exists, because the continuity aspect cannot be formed agglomeratively from its identical opposite in the Euclidean point. But, as we will see,[v]* and according to the Principle of Absolute Reversal, the identical opposite of the extensionless point in the continuum is found by taking the concept to the ineffable absolute scope, and this is the polarity enfolded in the uni-axis, i.e. between the immanent point and the transcendent continuum.

The uni-axis is thus the omni-non of extension with its polarity and cultivated third between omni-extension in the ONE and the non-extension of an immanent singularity at one Euclidean point. An interesting feature,

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[i]* Recall Figure 7: The Nuclear VCS Diagram With Coordinates:, p144.

[ii]* See, The Nondual-Rational and Empirical Embryogenesis of Mathematics, p217.

[iii] It is also the polarity of Spinoza's Substance/God, with omnilocal immanence-in-transcendence equating to Substance, and omni-local transcendence-in-immanence equating to "God." This last point takes us far afield, but see Leibnoza Von Spinbitz (p659), to jump the line and explore further.

[iv] We are not here using the term 'singularity' in its strictly mathematical and operational sense. Rather, we use the term to highlight the infinity hidden in the "infinitely small" Euclidean point. Indeed, this implicit infinity is the very source of the immanent infinities (mathematical singularities) found when physicists of the early twentieth century tried to calculate the energy of an electron—represented as such a point—as an inverse-squared function of the distance to its center and its non-existent terminating surface.

[v]* See Exploring the Univocity Framework, p190.

therefore, shared between the infinite I/T uni-axes, *and* the one omni-axis which they compose, is that they ALL converge and overlap at the transcendent pole of the ONE. At the same time, however, the immanent poles of *any* two selected uni-axes, at whatever scale you may choose, are separated by an "infinite number" of other uni-axial singularities (see Figure 8-A below).[i]* This recognition—that two points can be "infinitely close" together and always infinitely far apart, in terms of other points—is one of those counterintuitive, labyrinthine aspects of the absolute scope of immanence (or yin) and continuity which Leibniz recognized in his exploration of the continuum. He reconciled it finally, as we will see, in his secret "Spinoza studies," of 1667[ii] when he acquired Spinoza's (now famous) *Letter XII* on the infinite. At this time, Leibniz began to see mathematical points not as Euclid saw them, as elements "composing" the continuum, but the reverse, as Spinoza saw them, essentially as immanent aspects (singularities) *abstracted from* The Infinite univocal ONE is ALL.[iii]*

Identically-opposed to the immanent *singular infinity* of the I/T uni-axis is the *infinity of singularities* of the omni-axis. The omni-axis is the I/T-axis, and its Euclidean singularity, conceived not as a finite unity[iv]*—or "one" single uni-axis and abstracted position—but as an infinite totality of uni-axes, "composing" or *a posteriori* abstracted from the labyrinth of the *a priori* continuum of the undifferentiated absolute scope. Because the omni-axis is omni-local, it is also non-local, in the sense that it does not differentiate one uni-axial position from any other, but conceives of them all as an undifferentiated continuum of loci making up the singular ALL of extension. To take on *ALL* positions is to take on *none* of them and thus the omni of position is also its non, as we would expect with the Principle of Absolute Reversal and the univocal aspects of the absolute scope.[v]*

The omni-axis is the IT axis whose locality aspect is "seen" (or unseen) at the absolute scope, through the "eye" of Infinite Unity[vi]* to give us omni-non-locality.[vii] Poetically speaking, in the omni-axis, the pupil of the eye of locality and its boundary is *fully and entirely* opened, so that the eye itself—and its limiting/enabling differentiated, boundaries, positions and

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[i]* This is another aspect of the trans-trans-bias. See The Image of the Trans-Trans-Bias, p312.

[ii] As Samuel Levey termed it in his article "Leibniz on Mathematics and the Actually Infinite Division of Matter."

[iii]* For further information, see, for example, Spinoza's Triune Infinite (p270) and Reconnecting the Lost Thread of Mathematical Rationalism: Spinoza, Leibniz, Immanence and the CalculusReconnecting the Lost Thread of Mathematical Rationalism: Spinoza, Leibniz, Immanence and the Calculus (p400).

[iv]* See the related discussion on The (Binary) Cycle of Unity, p254.

[v]* See Exploring the Univocity Framework, p190.

[vi]* See Infinite Unity: ALL is ONE, p240.

[vii] … incorporating in the omni-non the identical opposite necessary at the absolute scope…

perspectives—has actually disappeared in the complete omni-directional opening of its boundary. This, in part, is the continuity aspect of The Infinite.

The omni-axis is the VCS representation of the 'ONE-ALL' tautology and identity of univocal multiplicity, whereas the uni-axis is merely the locus of the 'one' of "finite unity;" i.e. the immanent singularity and its boundary, respectively.[i]* This distinction between the absolute unbounded 'ONE' and the relative 'one' of boundary will be explained in much more detail in the section on Unity and Nonduality. But it is important to note that both the uni and omni forms of the immanent-transcendent axis—as all VL-axes of the Vision-Logic Coordinate System—are mere abstracted *aspects* of "The Infinite," as we will see in the section on Spinoza's Triune Infinite.[ii]

Recalling the two previous diagrams of the immanent-transcendent axis, we can simplify, modify and compare them, side by side, to differentiate-and-integrate the omni- and uni- axes (See Figure 8, below). The interface or cultivated third of the immanent/transcendent polarity in its *omni-non-local* aspect (i.e. the omni-axis), is a transitive "plane," (see side A of Figure 8, below). Recall, however, that the image of the plane is a mere convenience, both of speech and of imagination. For the sake of higher-level, aperspectival, visualization and simplification of the omni as a uni-directional axis, the familiar 3-dimensions—xyz and all infinite uni-directions in-between—have been collapsed into the "transitive" planes fixed upon the central I/T "axis." Such transitive planes—"planes of existence" or "levels of reality" as they are often called in cosmogonic texts[iii]—in the real world correspond to the emergent/transcendent, yet relatively fixed scales (or "Kosmic grooves") of nature, such as the "Planck scale," the level of atoms and the level of cells. The "transitive plane," therefore, is actually a planar *cross-section* of an infinite *volume* or *extension* whose vastness is *defined* relatively and transitively to a specified scale (coordinate on the I/T axis) of *a priori* volumetric spherical units. Each one of these nested (holonic) units, however, is the spherical and omni-directional I/T interface of a single uni-axis.

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[i]* See Unity and Nonduality (p239), and The (Binary) Cycle of Unity (p254).

[ii] The I/T omni-axis is, mathematically-speaking, non-operational, due to its taking on of the properties of the absolute scope in its omni-/non-locality. In other words, in order to operate mathematically, one position (ideal point and immanent pole of an I/T axis) from the infinite must be abstracted and selected so as to construct the first number in Operational Mathematics, the volumetric boundary (a real-point). We'll explore this in much more detail later. See for example Empirical/Experiential Beginnings: Bucky's "Operational Mathematics" (p217), The (Binary) Cycle of Unity (p254) and The Holarchical Unfolding of Number and Operation (p306).

[iii] See, for example, The Secret Doctrine, by H.P. Blavatsky or Ken Wilber's Integral model.

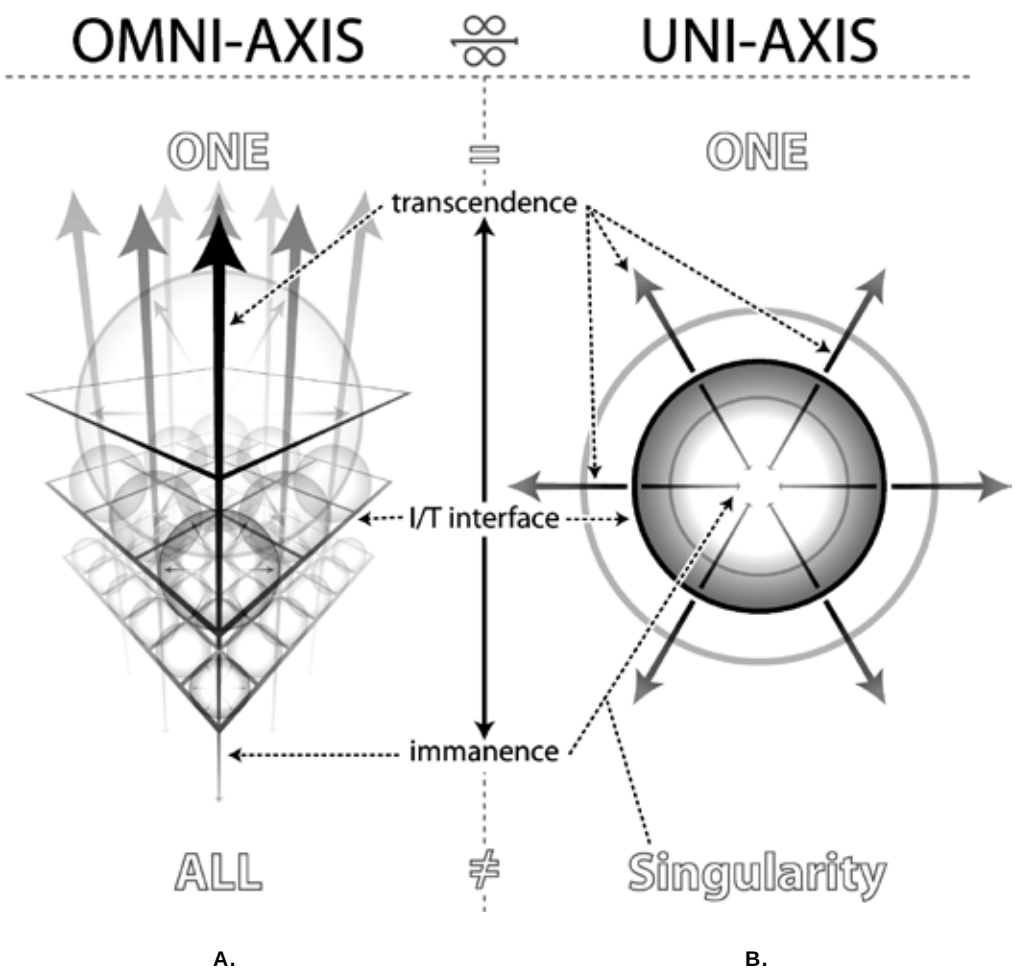

Figure 8: The Omni and Uni Axes and Interfaces:
Figure A shows an "expanded view" of the omni axis and the "transitive planes" as the interfaces of the immanent and transcendent directions in the omni-axis. If we collapse the representationally expanded planes, again overlapping the spheres making them concentric, however, we can see that the transcendent direction is not really upward, or linear, but outward, from all points of the continuum. Each of the boundless series of nested spheres in the transitive plane of the omni-axis is the interface of a uni-axis (B) ALL of which are contained in the omni-axis, and each of the points making up the volumetrically extended continuum of the omni-axis is the immanent pole or Euclidean singularity of a uni-axis. Note also, that as we move immanently on the omni axis, the number of uni-axes between any two (and their spherical interfaces) increases indefinitely, and—at the absolute scope of The Infinite ONE-ALL—actually *is* infinite.

At this point an interesting relation has begun to appear between the ALL-ONE, the omni-non and the aspects of position and extension (or continuity). The omni-non of *position*, recall, is the ALL-ONE, or the "omni-uni" of extension (the omni-axis), and the omni-non of *extension* is the omni-uni of position (a single uni-axis between the ALL-ONE and the singularity). This gives us an interesting polarity between the aspects of position and extension (or continuity) when taken at the absolute scope of the omni, or the ALL—which is the infinite multiple aspect of the ONE of Infinite Unity at which both omni and uni axes converge.[i]* The aspects of extension and position, when taken at the absolute scope, appear to be identical opposite of each other, in this sense. But in quantitative terms, the uni-aspect of the uni-axis (the *one* singularity) is finite and the uni-aspect of the omni-axis (the ONE of ALL uni-axes) is infinite. The quantitative difference between the uni-aspects of the uni- and omni-axes (i.e. the 'one' and the 'ONE,' respectively), therefore, presents us with the critical polarity underlying the Cycle of Unity, as we will see.

While the omni- and uni- axes converge at the transcendent pole, the interfaces of each are vastly different. The interface of the uni-axis, as we have seen, is an arbitrarily defined mathematical, or real-world emergent, spherical/spheroidal boundary, whereas the interface of the omni-axis is an infinite expanse of a mathematical/metrical or physical substrate; e.g. a cubic grid or an "isotropic vector matrix" of imaginary or real metric units or a relatively uniform volumetric expanse of real atoms; a "level of reality," or a "plane of existence." The polarity between the I/T interfaces, therefore, swings us from the unity of the relative (finite unity) in the unit-interface of the uni-axis, to the unity of the absolute (Infinite Unity), in the ALL-ONE. This is key, as we will see, in the Cycle of Unity.

[i]* See Infinite Unity: ALL is ONE, p240.

A CONCLUDING NOTE ON THE VCS: INTEGRATING THE DIFFERENTIATIONS

The tendency when we delineate all of this stuff and break it down into its subcomponents, with infinite levels of transitive planes exfoliating from an immanent-transcendent axis (itself composed of two types), is to forget to put it back together. The immanent-transcendent and transitive axes ultimately form an orthogonal polarity, a conceptual symbiosis. The first unit, the number 1, emerges from the uncountable I/T axis as the decided unit-boundary, the chosen scale of measurement, allowing the transitive operations of addition and subtraction (and in physical reality, agglomeration and evolution) to begin. Then, with the operations of division, the immanent-transcendent axis is again invoked or awakened as the mathematical ratio dissolves or "violates" the "closure property" and opens up the immanent pole of the Rational numbers (all of which we will discuss in detail in Interface Mathematics).

Furthermore, these infinite levels abstracted and represented on the immanent-transcendent axis, do not necessarily exist *somewhere else*, in the *erewhon* of "mere mathematics," or in different worlds, but, as *SpinbitZ: volume II* will explore in depth, they *emerge* into every scale as the very forms of the relative, such as the "ergodic" and fractal complexities of nature (see Saturn's rings, for instance that manifest the infinite complexity in its energy fields, as an instance-definition of ergodic).

With this conceptual framework in mind, our task ahead will be much simpler because we have made explicit the many implicit, "pre-fused" differentiations that so often *con*flate and "con-fuse" these absolute-level discussions, manifesting in the various paradoxes of the infinite, and of free-will vs. determinism, for example. We can now cast aside the shells so often unwittingly employed in the game of philosophy and, perhaps for the first time, begin to move these symbols around freely, on our conceptual game-board, in the light of reason.

THE UNIVOCITY FRAMEWORK (UF)

There has only ever been one ontological proposition: Being is univocal…..A single voice raises the clamour of being…

— Deleuze, *Difference & Repetition*

UNIVOCITY

This section operationalizes the concept of Univocity into a rigorous and intuitive framework that provides a simple conceptual "space" for open and honest ontological speculation, maintaining the necessary nondual relativity of this ontological space and its resident or emergent concepts and relative truths in polar contrast to the Truth of the absolute scope. This operationalization of Univocity enacts and softly enforces the principle of nonduality by explicitly recognizing the fundamental Nagarjunan/Spinozan/Deleuzian polarity between the absolute and relative "scopes."

Univocity: Introduction

> *Univocity is a very strange dice game. If we are to play the game, nothing can remain the same.* — Beth Metcalf, *Widder's Genealogies of Difference*

Univocity is explained by Deleuze as "the idea that all events are compatible; they are 'inter-expressive'. ***Being has one voice but can only express differences***." And Todd May says, "What univocity implies is not that everything is the same, or that there is a principle of the same underlying everything, but, instead, precisely the opposite. With univocity comes difference, difference for the first time taken seriously in itself."[i¥]

Univocity means that every expression of existence is different in a fundamental sense from every other. And yet the unity aspect of the concept signifies that these differences are fundamentally causally intercompatable, or 'inter-expressive.' This is the identity of opposites of difference and similarity, because indeed without this inter-expression or inter-relation, differences could not interface or relate in order to *really* differ. And thus, with univocity, difference (or relativity) is "*taken seriously* in itself" and given a framework for actualization and understanding.[ii] It is this basic, or "fundamental," framework, expanded and operationalized herein, upon

[i¥] (May)

[ii] Actualization and understanding are ontic and epistemic respectively. See the section below, Univocity and the Vertical Ontic/Epistemic Polarity, p176.

which any healthy and "holistic," or integral rationality must be built (in some form or other), and we have already seen it as the implicit essence of ancient and esoteric nondual/perennial philosophy,[i] such as Taoism, Advaita Vedanta Hinduism, Madhyamaka Buddhism. It is also seen in the West in some forms and levels of Christianity, Neo-Platonism, esoteric Spinozism, and in some of the pre-Socratics, such as Heraclitus.

This fundamental "causal" or "expressive" intercompatability of univocity, giving meaning and truth to relativity (instead of relativity to Truth), is what Deleuze sees as the core of rational/empirical philosophy as it winds its way through western History from the Stoics to Duns Scotus to Spinoza to Leibniz to Nietzsche to Bergson, through Deleuze and beyond. This univocal relativity, or multiplicity, is the defining essence of Spinoza's Substance,[ii] for instance, as opposed to its common academic intepretation as a "principle of the same," or a foundational material substrate, underlying and unifying everything. And as we have discussed, the re-emerging esoteric understanding of Spinozism, catalyzed by Deleuze and others, is essentially nondual and non-foundational.

Nondual Rationalism takes it further, at least explicitly, and shows that the more coherent understanding of Spinoza's Substance is ultimately based not on any foundational "transitive-plane" (substrate) immanent to observed reality (e.g. Deleuze's plane of immanence), but rather on the positive, *a priori*, and non-regressive notion of deep infinity, which we have operationalized in the Vision-Logic Coordinate System as the immanent pole or emphasis of the Immanent/Transcendent axis. It is the identification of Spinoza's Substance with the notion of positive infinity in Deleuze, and with the immanent pole of the immanent/transcendent "axis" herein, that brings rationalism out of its modern academic exoteric misinterpretation as a foundationalist formless-absolutism or even a materialism or scientism (or "eco-philosophy," as Ken Wilber might put it), and into a nondual, "foundationless-foundationalism" or a "rootless-rootism," that re-opens and re-animates the project of rationalism and sets it on its feet again.

In true rationalism, unshadowed by the reactionary misinterpretations and pre-rational tendencies (e.g. the transcendent-bias, or the "forces of representation"), of post-/modernity, the one foundational principle (or

[i] Aldous Huxley defines it as "the metaphysic that recognizes a divine Reality substantial to the world of things and lives and minds; the psychology that finds in the soul something similar to, or even identical with, divine Reality; the ethic that places man's final end in the knowledge of the immanent and transcendent Ground of all being; the thing is immemorial and universal. Rudiments of the perennial philosophy may be found among the traditional lore of primitive peoples in every region of the world, and in its fully developed forms it has a place in every one of the higher religions" (The Perennial Philosophy, p. vii).

[ii] Throughout this work, I will be using "Substance" rather than "substance," capitalizing the S to denote an absolute scope. This can serve as a reminder that we are not talking about a foundational substrate, but rather the I/T axis itself, if mainly an immanent emphasis.

axiom) is that there can be no foundational principles, i.e. that axioms, principles, truths and laws themselves, are emergent, relative, fallible and generally epistemic (e.g. Sheldrake's "habits of Nature"), rather than absolute, eternal and handed down from a transcendent God to be implanted[i] in a fallen Nature (Eve).

This is the axiomless-axiom or foundationless-foundationalism, as we have seen, and it is basically an epistemological analog the nondual and univocal ontology.[ii]*

Univocity: Monism, Polarity and the Nondual

The defining feature of the nondual is polarity. And, of the ancient traditions, the most useful nondual tool is the Taoist concept of the identity of opposites, visually and viscerally embodied in the yin-yang symbol. The identity of opposites states that in the very heart of any opposite is its other, without which it would be inert and meaningless. And, as we have discussed,[iii]* a polarity is the equivalent of a conceptual opposable thumb. Without the use of polarity, the conceptual "opposable thumb," the mind finds it virtually impossible to "grasp" ideas or concepts: it can't relate.

In the univocal context, opposites or polarities, as the simplest, most general forms of difference, are fundamentally inter-expressive. They share a unity in this one voice, where "divergence is affirmed and disjunction becomes a positive synthesis…[and] all events, even contraries, are compatible."[iv¥]

This triune nature of the interface in polarity we have discussed is inherent in the principle of univocity. In the same way that insides can have no meaning or expression without outsides, so the relative scope can have no meaning or expression without the absolute ... and vice versa. The identity of opposites (or dependent arising) is the univocal "quantum tunneling" between opposed numerical identities (absolutized concepts) revealing the infinite axis of difference within (e.g. Emptiness). These are the immanent forces of intensity characteristic of univocity, which dissolve and support the representational surface-forces of opposition (see *Univocity and Force*, p168, below).

Nondual traditions take this principle of polarity at the absolute scope (albeit tacitly) and use it to break the bonds of single-concept absolutisms, terms as terminals, or "mono-poles" (e.g. materialism and idealism), that unceasingly attempt to "mono-polize" the infinite and eternal enfolding and

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[i] (((or *artificially* inseminated)))

[ii]* See also the section Univocity and the Vertical Ontic/Epistemic Polarity, p176.

[iii]* See the previous section Phase TWO: Polarity and the Opposable Thumb of the Mind, p112.

[iv¥] Logic of Sense, 177 qtd in *Widder's Genealogies of Difference* by Beth Metcalf

unfolding completeness of the hidden and ineffable absolute scope. We want ultimate understanding, and so we attempt to encapsulate the Absolute, or populate the absolute scope with what we can understand; e.g. terms, concepts, Forms and Ideas, and generally the favored pole of any meaningful polarity, such as matter over mind, consciousness over non, or Emptiness over form, or vice versa on all counts.

But the logic of Univocity softly "forbids" identities (mono-poles) from colonizing the absolute scope because this would absolutize similarity at the expense of difference, spreading a "principle of the same," like a "gray goo,"[i] to the infinite, which would deny the active property and infinite difference of nondual existence, modification and the relative scope itself.[ii] In other words, these mono-polizations are static foundationalisms or reductionisms, taking the finite unity of the concept to the infinite extreme of the absolute.

This is the general feature of *traditional* interpretations of monisms, such as academic/exoteric Spinozism, rational materialism, empiricism or idealism. We have already seen in the Inverse Unified Field that the seeming monism of atomism, a single indivisible kind of stuff flitting around in the void, is not properly a monism, but rather a dualism between stuff and anti-stuff, matter and void, or form and the formless. In the monistic system of academic/exoteric Spinozism, for example, the absolute scope is "colonized"[iii] by the formless mono-pole (i.e. formless absolutism). Platonic or Berkeleyan idealism, on the other hand, would take the opposite tact (interestingly similar to atom-voidism), and absolutize the form mono-pole of concepts and ideas. Leibniz's monadology, however, at least at the immanent pole of the uncountable I/T axis, would be a good example of a nondual symbiogenesis of form and Emptiness in his infinite immanent holarchy, which is identical in form to the esoteric view of Spinozism, we will find, which we have already seen in the Principle of Nondual Rationalism.

This monistic mono-polization of the absolute scope and violation of the logic of the Univocity Framework, illustrates explicitly that a traditional monism is not a nondualism, and hence is actually a tacit dualism—in this case, between form and the formless (Emptiness). Placing one pole in the erewhon of the absolute scope and leaving the other in the relative creates

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[i] The idea in nanotechnology that a single self-replicating "nano-bot" could replicate itself at an exponential rate, and take over the earth with the monotonous similarity of its ceaseless repetition.

[ii] …which self-recursively generated the absolute scope in the first place. See the coming section on Polarity and Univocity, p174.

[iii] Given that the absolute scope is defined by its absence or opposition to relativity, it makes no sense to think of it in terms of space or location. The absolute scope can't be colonized period, and it is not a place outside the relative world. It is merely the relative world attempted to be "seen" from an infinite perspective, and this is already a "contradiction in terms", which, we have seen, is a natural property of the absolute scope. See also the section, Part Two: Interface Mathematics (p200) and Spinoza's Attribute Polarity and "The Nucleation of Observability" (p486) which explain how a point of view is the identical opposite of the Infinite.

an absolute distinction between them, and hence these *vertical* alignments of *absolute* polarities are "forbidden," or simply meaningless, in the Univocity Framework.[i]

Conversely, any "monism" with a Univocity Framework is more properly considered a nondual system because Nondual Rationalism demonstrates (as we will see[ii]*) that univocity is an ontological application of the identity of opposites and polarity, which at the absolute scope is the defining feature of the nondual. In Univocity, the absolute scope is the emptiness in form. It is the opening of the relative scope to its identical opposite. A monism is formed by absolutizing this polar distinction through the use of concepts.

As we will see, and which may be intuitively obvious, verticality and horizontality correspond to the I/T and the transitive axes, respectively. The vertical polarity of univocity—the abstract rootless-root-polarity of the immanent-transcendent axis—is the axiomless framework, or vision-logic interface that operationalizes and softly enforces the logic of the nondual which "forbids" the vertical alignment of conceptual polarities that terminate in the absolute scope. It does this by specifying the epistemic absolute scope as the identical-opposite to the epistemic relative scope, and hence to relativity and polarity itself.

The absolute scope is actually launched from the relative scope, through the application of polarity (the root of relativity) to itself (see, *Polarity and Univocity*, p174, below). Relativity, then, to reach its identical-opposite in order to give it meaning and context, operationalizes the absolute scope necessarily as ineffable and holds open the space of deep infinity (logical Emptiness) to ensure that no mono-poles can colonize the absolute scope and collapse into "flat-land" foundationalisms and absolutisms.

Spinoza's Univocity

> *He shapes a rigid crystal: the infinite Map of the One that is All...* — George Luis Borges, *Spinoza* [iii¥]

As Beth Metcalf says in her article, *Univocity is Multiplicity,* "Deleuze's Univocity is Spinoza's Univocity. However, Deleuze's reading of Spinoza is not that of the common sense appropriation by traditional Representational forces. Deleuze sees something new in Spinoza."

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[i] Polarities completely within the relative scope, however, can be vertical or horizontal, because the relative scope is the home of polarity. These vertical polarities include any holarchical emergent, such as the ontic/epistemic polarity, though a vertical, or holarchical polarity has a necessary transcend-and-include asymmetry to it, characteristic of holarchies in general, and this is the actual or ontic source of the transcendent-bias itself.

[ii]* See Polarity and Univocity (p174), below.

[iii¥] Translation by Yirmiyahu Yovel

What is it that Deleuze discovers in Spinoza which is opposed to "traditional Representational forces"? Nondual Rationalism recognizes, among other things, a transcendent-bias in operation behind traditional Representational forces. As we have discussed,[i]* it is this transcendent-bias that generates the medieval and pre-rational metaphysics of foundationalism and the regressive or negative infinity that appears when the foundation crumbles into the analytic abyss. The modern orthodox or traditional view[ii] sees Spinozism through this implicit transcendent-bias,[iii] reinforced with a history of transcendent-biased mis-interpretations, from Leibniz to Kant to Hegel, and hence it sees a foundationalism or even a materialism whose ultimate level of reality is a single *amorphous* and inert (dead) substrate of material "stuff," a "principle of the same," or an abstract generality, eternally underlying, unifying and ultimately denaturing—as Hegel and Leibniz would famously claim—all modifications or differences. This would be a monistic (as tacitly dualistic) and reductionistic representation of Spinoza as absolutizing the formless, or Emptiness (unity or generality), over form (multiplicity and difference). In modern academia this would be called an "intertheoretical reduction" of form to the formless, and generally the immaterial to the material.

Hegel accomplished this faulty interpretation of Spinoza—which has lodged itself into distortions of the very lens through which academia views Spinoza—in part by a simple and subtle remapping of Spinoza's meaning with respect to his words. He distorted Spinoza's resonance between what Deleuze would call his plane of immanence (implicit meaning) and his "plane of transcendence," (explicit concepts), and thus moved academia away from the "plane of consistency" in Spinoza. Hegel confused Spinoza's expository geometrical method with the concepts it was meant to convey. As Will Durant explains:

> It was by combining Spinoza with Kant's epistemology that Fichte, Schelling and Hegel reached their varied pantheisms; it was from *conatus esse preservandi*,[iv] the effort to preserve one's self, that Fichte's *Ich* was born, and Schopenhauer's "will to live," and Nietzsche's "will to power," and Bergson's *élan vital*. Hegel objected that Spinoza's system was too lifeless and rigid; he was forgetting this dynamic element of it and remembering only that majestic conception of God as law which he

[i]* See the section, Foundationalism, the Infinite Regress and the Transcendent-bias (p91).

[ii] A flatland straw-man generated in reaction to modernity and rationality mainly by its theocratic critics, Leibniz and Hegel, both of whom were idealists.

[iii] And Spinoza's Attribute Polarity and "The Nucleation of Observability" (p486) points out the objective-ontic shift that renders Spinozism into a materialism.

[iv] Spinoza's modern, homeostatic, complexity-science, strange-attractor conception of "essence" as "The endeavour, wherewith everything endeavours to persist in its own being…" from the Ethics, Part III VII. This, as we will see in Univocity and Essence (p170), is a "reciprocal" or polar notion of essence that does not precede existence, but is symbiogenetic with it.

> appropriated for his "Absolute Reason." But he was honest enough when he said, "To be a philosopher one must first be a Spinozist."

A major difficulty for modern philosophy students is that Spinoza inherited a lexicon "stuffed with medieval barbarisms such as 'substance' and 'attributes,'" [i¥] which was custom evolved for developing pre-rational foundationalisms. But nowhere does Spinoza ever say that his Substance exists at any single or particular *level*, immanent or transcendent to its modifications, or that Substance, at any level, can *exist* without being actively formed or modified[ii] or that Substance is equated with matter. Quite the contrary, Spinoza makes it clear that Substance is the rootless-root of existence; activity itself, but only in the sense that—as the absolute scope and axis of Tao—it enfolds and unfolds all polarities, including flux/stasis, and hence it can't be acted upon, set in motion or stabilized, by anything else, because as the absolute, there isn't anything else. Spinoza says in his precursor to the *Ethics*—essentially a rough draft called the *Short Treatise on God, Man and his Well-being*,[iii]—"God, it is said, inasmuch as he is a supremely perfect being, cannot be passive." And indeed, Nondual Rationalism shows the precise reason that mono-poles (terms) such as 'passive' and 'active' simply have no function or power at the absolute scope allowing us to more closely reach the plane of consistency in Spinoza's thought. Hence Hegel's claim that Spinoza's Substance was too rigid, too passive, or too positive, is based on a category error; a failure to understand Spinoza's Substance univocally (see also *Univocity and Polarity*, p174). It is

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[i¥] Mathew Stewart, *The Courtier and the Heretic*, p179

[ii] Spinoza says that substance can be *conceived of* axiomatically or logically without modifications, but this establishes the relationship of immanent-causal, and logical dependency between eternal Substance and its temporal modifications (i.e. between the absolute and relative scopes); a dependency enforced by the geometric logic of the exposition, not the univocal framework itself. Indeed the Univocity Framework takes a reciprocal, polar or nondual approach to the Substance-modification relation, and with Deleuze, takes Substance to "turn around its modes" just as Emptiness turns around form, and vice versa, on both counts.

The relation does not specify an actual duality or that substance can exist without its expressions in modifications. Indeed, existence *is* expression. *Substance* is "logically prior" not temporally, given the axiomatic geometric framework through which Spinoza chose to represent his model. Furthermore, Spinoza says that the intellect conceives and perceives the essence of Substance through the attributes, but what is it that the intellect ultimately conceives and perceives? Modifications. Through the attributes they appear as modifications of Thought or Extension (internal vs. external, respectively), but Spinoza tells us that the only thing that really exists is Substance (deep infinity) and its modifications. Therefore, in a sense, modification itself is part of the essence of Substance, and vice versa. Indeed, "active modification" seems to be a descriptor for existence itself, which Spinoza says "pertains to the essence of Substance." And this notion of an essential polarity between Substance and its modifications, brings us right back to the polarity of Emptiness and form. Emptiness (also called Fullness) is the infinite depth of Substance, Leibniz's labyrinth of the continuum, and our principle of nondual rationality as infinite divisibility = indivisibility, and form is the necessary inclusion of modification in the unbounded levels of active existence.

[iii] also called the "*The Book of God*."

entirely likely that Hegel confused the rigidity of the geometric style, or the "presentation layer" of *The Ethics* with its actual content.

Substance is eternal, or eternity itself,[i] not because it is static and immovable, but because it is existence itself taken at the ineffable scope of the Absolute, which enfolds and unfolds all polarities, including flux/stasis. There is simply nothing beyond the absolute scope of "ALL is ONE," by definition, to act on (or stabilize) Substance, because the absolute scope was generated from the application of polarity to itself in order give it dynamic context and meaning in its identical-opposite.

Furthermore, the medieval, exoteric notion of substance already had a very specific and neutral meaning as merely that neutral foundation which "stands beneath" the forms of perception; i.e. sub-stance, the substrate of *raw* existence not specified as to its materiality or non. But Spinoza departed from that traditional foundational view of a substrate, or plane of immanence, and adopted a univocal view which Deleuze recognizes as the positive view of infinity (*apeiron*), and I have operationalized as the immanent/transcendent omni-axis, the axis of Tao, or the absolute scope.[ii] As we will see, this interpretation allows us to transcend foundationalism *and* coherentism while integrating the truths of each.[iii]*

In Spinoza, modifications don't occur without Substance and Substance doesn't occur without modifications, regardless of scale. This means that substance, as the identical-opposite of modifications, is not a function of scale. It is not an amorphous or unmodified substrate residing at some particular level (I/T coordinate) immanent to its modifications in order to counter a "disastrous regress" brought about by falling from the perch of the transcendent-bias. Rather, Spinoza's Substance is generated in an escape from the regress, not to a foundational substrate, but to the *a priori* positive infinity of the absolute scope and Immanent/Transcendent axis itself. Spinoza's Substance is therefore ultimately (absolute scope) both immanent and transcendent to its modifications. It is the All is One, or as George Luis Borges says, the "One, who is all His stars."

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[i] Because Substance is at the absolute scope, saying "Substance is 'eternal'" necessitates that we simultaneously mean the identical opposite, that substance is infinitely and irreducibly instantaneous. And hence the fully univocal statement about the temporal aspect of Substance would be "Substance is instantaneous and 'eternal'" or the "eternal NOW," as it is commonly phrased. Univocity as Deep Infinity: Prigogine and Leibniz (p182), and Univocity and the Eternal NOW (p187).

[ii] Substance can be considered merely an immanent emphasis on the Immanent/Transcendent axis of which God is its identical opposite transcendent emphasis, and more identical than opposite, in this case.

[iii]* See Interface Epistemology: A Preliminary Sketch, p541.

The two attributes given by Spinoza, which express the essence[i]* of Substance, are merely the aspects essential to the way in which modes can be formed, perceived, conceived and comprehended. In Spinoza, the attributes are not ultimately separate. They form a polarity of the within and the without at all unbounded levels of modification on the I/T axis. This is why they are strictly parallel: you can't causally interact or connect what is not disconnected and you can't unify what is already inseparable.[ii]

As we will discuss in the section on Spinoza's Attribute Polarity (p486), the attributes are merely two ways of conceiving/perceiving the one Substance, and they arise from the nature of *a priori*, yet emergently modified and active Substance, each modification (or holon) of which necessitates an inside and an outside. This "sub-representational" polarity is the root of the ontic parallelism of the attributes[iii]* and, in Wilber-speak, this is an essentially "AQAL-compliant" and post-metaphysical view, though Spinoza enfolds the multiple and singular polarities into his single attribute polarity: he hasn't yet made the differentiation into the plural quadrants in this embryogenesis of the concept of dependent arising (see *From Dependent- to Tetra- Arising: The Conceptual Embryogenesis of AQAL*, p561).

The point of this parallelism is to prohibit what Wilber calls a "quadrant absolutism" or "quadrant reductionism,"[iv]* and the effect, when understood in this way, is that mind, or the Within (Thought), can't be reduced to matter, or to the Without (Extension), and vice versa, in either its singular or plural forms.

On a side note, Deleuze says that univocity is the organizing principle of Spinoza's system. Yet he is often criticized for this unorthodox interpretation because nowhere does Spinoza even mention the term 'univocity'. But it seems rather clear that a system can have specific operational properties and qualities without the author mentioning them by a specific name, especially given that the name might not be known to the author, and the pervasive principle might be in use quite subconsciously.[v]

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[i]* See the section Univocity and Essence (p170) below, to see how Spinoza's use of "essence" is thoroughly modern and indeed contrary to the modern notion of "essentialism."

[ii] This parallelism exactly mirrors the "tetra-arising" of the two singular quadrants, 'I' and 'IT' (within/without respectively), in Ken Wilber's AQAL matrix. And, according to Wilber, this is one of the key features of any "Integral post-metaphysics," the other being an emergent and non-foundational (i.e. nondual) ontology.

[iii]* See, Spinoza's Attribute Polarity and "The Nucleation of Observability", p486.

[iv]* See Identifying Quadrant Absolutisms, p561.

[v] Indeed, as we will see, Spinoza's Ethics can be shown to operate fundamentally on his notion of the Triune Infinite, even though he only explicitly mentions this triunity in his famous letter on the Infinite. See the section on Interface Mathematics and Nondual Rationalism, below.

In his attempt to understand Spinoza, Deleuze simply recognized an organizing principle in action that was apparently not explicitly known or acknowledged by Spinoza himself. And even though Deleuze famously explains his unorthodox studies of other philosophers as sneaking behind their backs and producing offspring which are recognizably theirs, yet changed and monstrous ("buggary"[i¥]), I have to see Deleuze's monster as Spinoza's legitimate and beautiful child because when I look at it I see Spinoza ever more clearly. Indeed, my own Spinozist monster, produced before meeting Deleuze/Spinoza,[ii]* and in reconciling the traditional hermeneutic problems of Spinozism, i.e. finding the plane of consistency in Spinoza, the model bears a striking resemblance to that of Deleuze's Spinoza.

Univocity as Multiplicity

In another article, *The Immanence of Univocity*, Metcalf says, "This Univocity says that Substance is qualified as really and formally distinct... [Substance] is never qualitatively the same. Even in itself, it is not the same. It is difference in itself.... if we think that Univocal Being means that Being is 'the One' or that Being has a common, unitary ground to which 'the Many' beings are identical, then we are still talking about the One/Many that never reaches the Multiplicity of Univocity." The absolute scope is both the ON and the All, and cannot be likened to an absolute similarity or an absolute difference, one without the identical-opposite of the other. This "One/Many" with a "common, unitary ground [the "One"] to which 'the Many' beings are identical" is the standard foundational interpretation of Spinozism which the exoteric forces of representation (orthodox academia) generated in reaction to modernity[iii] and rendered incoherent. It was largely an unconscious, collective straw-man effigy; a reaction against the foundations of rational Modernity, which threatened the entrenched pre-rational, transcendent-biased, theocratic power structures and the immortality projects of the "center of gravity" of Enlightenment-era society; its "immortal soul," absolute free-will, and theocratic power structures based thereupon.[iv] We can see this directly in the massive denouncement of Spinoza all across the social structure of the times.

Deleuze, however, gives a more coherent, and trans-foundational (univocal and nondual) interpretation with the discovery of Spinoza's Univocity. And many others have recognized the nondual aspect of Spinozism, even seeing it as a Western form of nondual Buddhism or

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[i¥] Deleuze, *Negotiations*

[ii]* see my article, Spinoza's Attribute Polarity and "The Nucleation of Observability" (p486), now expanded as a chapter in this volume.

[iii] through Spinoza's critics, Leibniz and Hegel, et al.

[iv] See *The Courtier and Heretic* by Matthew Stewart

Vedanta. For example, Schopenhauer said about Bruno and Spinoza, "The banks of the Ganges were their true spiritual home; there they would have led a peaceful and honored life among men of like mind."

Nondual Rationalism reconciles and integrates the two independent unorthodox accounts of Spinozism, the Eastern and Western esoteric readings, by recognizing and explicating the realization that Univocity *is* nonduality, and thus the East and West meet in Spinoza/Deleuze. These two unorthodox accounts, along with others such as the insights from Matthew Stewart, together represent a much stronger front to the slights of orthodox, exoteric, flatland, lowest-common-denominator (LCD) appropriations by "traditional Representational forces."

Opposed to the foundational One/Many monism (and tacit dualism), where the Many are reconciled and unified by the distant (immanent or transcendent) One, Deleuze recognizes instead the *identity* of "ONE is ALL" as invoking the *a priori* infinite multiplicity of univocity. This can be stated as the identical-opposite,[i] "Unity is Multiplicity,"[ii] meaning that there is no separation or distance between Unity and Multiplicity or between ONE and ALL. They are one and the same, an inverse identity, or an identical-opposite, and this is operationalized directly in the I/T omni-axis, with its absolute poles in the ONE of transcendence and the ALL of omni-local immanence. As Metcalf notes, "Univocity is not opposed to multiplicity. Univocity is not to be confused with the one opposed to the multiple. Rather, Univocity IS multiplicity,"[iii¥] just as the absolute scope is the relative scope, in its other-engendering context. The appearance of separation itself is merely one of epistemic scope; absolute vs. relative, and it is the principle of Univocity which mediates as a triune interface between the polarity of scopes.

With this identical-opposite we can easily recognize the "ONE is ALL" as a function of the absolute scope, because, as we will see in much more detail, the absolute scope can only be addressed by such inverse-identities or tautologies.[iv] It cannot be adequately *addressed* (not mono-polized) by conceptual mono-poles (i.e. concepts, or terms). This is because the absolute scope enfolds and unfolds, or gives context to, ALL relativity, polarity, boundary, difference and distinction. And hence, as in the nondual

[i] …commonly confused for a "paradox" or "oxymoron"

[ii] Note that both terms of the polarity are in the absolute scope. See the discussion in Polarity and Univocity (p174) for details.

[iii¥] Metcalf, *Bergson and Univocity*

[iv] This brings us to Wittgenstein's notion of a tautology as the only possible "atom" of logic (ruling out axioms). As would be expected of the absolute scope, these logic atoms are devoid of factual content and there can be no natural ordering of these tautologies, i.e. they cannot be related one to another because they are at the absolute scope.

traditions, the absolute is ineffable. To eff the ineffable we relative beings must use relation, otherwise we can't relate.

In the case of ONE is ALL, the identity is between absolute Unity (ONE) and absolute Infinity (ALL),[i] this is the quantitative identity of opposites of the absolute scope. We have already noted the absolute sense of this inverse-identity, but here we can see a relative aspect as well. The ONE is ALL can be seen as the interface between the relative and absolute scopes of The Absolute. The ONE is the Absolute taken by itself,[ii]* from the absolute scope, and the ALL is the Absolute taken from the "pure relational" (or quantitative) view; the relative scope. This relative view of the Absolute (ONE), "absolute Unity," returns its identical-opposite, "absolute multiplicity," Infinity, the Everything or ALL. This is critically opposed to the Many, which does not explicitly, or even generally, indicate the infinite ALL of the absolute scope.

To put it simply, the ONE and the ALL, or Unity and Infinity, are the same thing, namely aspects[iii]* of the absolute, but seen from different epistemic scopes. It is the function of univocity to mediate between the two scopes; absolute and relative.[iv]

With this identity of the ONE is ALL, Spinoza's Substance as immanent/transcendent omni-axis, necessarily becomes infinitely modified[v]* and non- or trans-foundational because there is no principle of the same, and no axiomatic foundation, underlying and unifying its modifications into an absolute transcendent (or immanent) principle. As Beth Metcalf says "Whereas the Many in relation to the One merely makes the modes turn around Substance, Multiplicity makes Substance turn around the modes."[vi] This is rather obvious in terms of polarity, or the identity of opposites. In the balance of the two, neither Substance nor its modifications can have any meaning in isolation, regardless of the scale of those modifications, or of Substance.[vii]* And indeed, Spinoza sets up his distinction in the univocal form of a polarity, at the very beginning of his *Ethics*.

Substance is infinitely deep Emptiness and no single immanent plane of modification—of the infinite possible on the omni-local

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[i] The ALL is The Infinite or 1st order infinite, see the forthcoming section, Spinoza's Triune Infinite (p270).

[ii]* See, Infinite Unity: ALL is ONE, p240.

[iii]* See Spinoza's Triune Infinite (p270) for a discussion on "aspect infinities".

[iv] This is another example of the principle of "absolute reversal" in which, any concept, taken at the absolute scope, ends up at its identical opposite. See, Principle 4: Chord 3: The Principle of Absolute Reversal (PAR), p117.

[v]* … as we have already discussed in the section, Spinoza's Univocity, p158.

[vi] See, Univocity as Multiplicity, p163.

[vii]* See Substance and Bundle Views of Substance (p99).

Immanent/Transcendent axis (omni-axis)—can be ultimate, amorphous (self-identical) or foundational. Univocal Substance is infinite—our unbounded "difference in itself." And a limit to difference on the Immanent/Transcendent axis (i.e. a plane of immanence) would still be a limit. Furthermore, by the Principle of Immanence in Transcendence (yin in yang), it would also necessarily be a transcendent plane, relative to those beneath it from which it emerged.

In short, a nondual and univocal monism is an infinite pluralism via the identity of opposites of the One-All or Unity-Multiplicity. Univocity *is* the monism=pluralism identity of opposites in Nondual Rationalism.

Univocity and Numerical Distinction/Identity

> *…with Univocity, we realize that numerical distinction is always modal. Modal-numerical distinction is not to be mistaken for any numerical distinction of substances. This means that bodies are not substances.* — Metcalf, *What is Univocity?*

A numerical distinction (or identity) is one in which the distinction (or identity) itself is conceptualized as absolute, i.e. at the absolute scope. A common such distinction in philosophy is a "substance," typically conceived as an *independent* foundation upon which dependencies, modalities, properties, differences, etc, arise.[i]* Univocity recognizes, however, that identity and distinction are only meaningful *and real* as relativities, i.e. at the relative scope. This means that even in infinite difference and immanence, there must be a common *emergent* "ground" of causal intercompatability and inter-expressivity (not of absolute similarity or generality, however) in order for particular distinctions to relate and *really* differ. This "common ground," or plane of immanence is the triunity in relative or transitive polarity; the cultivating third,[ii] exfoliating and allowing the transitive polarities to emerge.

It is critical to note, however, that this plane of immanence is relative to its transcendent emergents, and is therefore not taken at the absolute scope as an identity itself, or a general "principle of the same." A plane of immanence is properly and abstractly conceived as an emergent level, scale or substrate of difference on the Immanent/Transcendent axis and therefore necessarily as transcendent to the immanent pole and its limitless depths of modification and immanent causation (Emptiness) from which it emerges.

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[i]* See Substance and Bundle Views of Substance (p99).

[ii] …as opposed to the "cultivated third" of transcendent and/or *a posteriori* unification.

Indeed, the absolute scope of Substance is only conceived as independent because it is the absolute scope itself, in its immanent aspect in polar opposition and union with its transcendent aspect, God. The dependency of Substance occurs not in the transitive direction, as in the dependent arising and "real difference" of the modes, but in the polarity and logical relation between Substance and its expression in and as modification. Because Substance/God is the absolute scope, maintaining the logical Emptiness of the form of modification in dependent arising, it can't be conceived as dependent in any relational or transitive way, but only as the ONE-ALL tautology itself. This is precisely why Spinoza says it can't be conceived as passive. It is activity itself, in identical opposition to its forms in passivity which it enfolds.

As opposed to the forces of representation, Univocity does not unify distinction after the fact, but provides the real and relative ground of infinite variability, and infinite difference itself, which allows for, and indeed necessitates, the emergence of *real* difference, Spinoza's version of dependent arising. "When there is no numerical distinction of individuals, there can finally be real distinction."[i¥] Note that Deleuze does not give a causal/visual reason for this necessary difference in every mode, but herein it is very simply understood with deep infinity, the Immanent/Transcendent axis and the infinite holarchy of relative form and modification.

As Deleuze says in his *Expressionism in Philosophy: Spinoza*, "Numerical distinction is never real….real distinction is never numerical" (p34). When parsed out in terms of scope, this is simply a recognition that *real* distinction is necessarily relative and sensibly conceived only at the relative scope, not the absolute, as tacitly conceived in the numerical distinction. This is again why the absolute scope of Substance/God is independent. Numerical or absolute distinction is unreal. It can only be tautological, as in the ONE-ALL.

As we will see in Part Two: Interface Mathematics (p200), this is also the difference between Infinite Unity and finite unity. Infinite Unity is not numerical because numbers are conceived in Interface Mathematics as boundaries whereas Infinity is simply boundless and hence the identical-opposite of a number. Infinity is the *unbounded* essence, the ONE = ALL, and Unity = Infinity (Infinite Unity), of the ineffable absolute. Number, on the other hand, is inherently relative as it functions to *relate* various quantities in the most general terms of pure categorical relation (pure relation).

Deleuze also notes, in the same work, that "…there is no Cartesian axiom [in Spinoza]…that does not take on a new meaning, hostile to Cartesianism, on the basis of the new theory of distinctions. The theory has as its fundamental principle the qualitative status of real distinction. Detached

[i¥] Metcalf, *Deleuze Versus Hegel*

from all numerical distinction, real distinction is carried into the absolute, and becomes capable of expressing difference within Being, so bringing about the restructuring of other distinctions" (p38). This carrying of real distinction into the absolute is simply the identity of opposites of the ONE-ALL. A singular distinction, of itself, must exist in relation and real distinction from other distinctions, and thus accessed at the relative scope.

As we will see in the section Spinoza: A Nondual Sketch (p665), this move to real distinction enforces a nondual dependent arising of all modification and the field of relation, i.e. the relative scope. This is the critical move, in the *Ethics* toward a nondual model.

Univocity and Force

> *...when there is the triumph of reactive forces, then there are relations of opposition and negation.* — Metcalf, *Nietzsche's Univocity*

As we have seen (and as we will see in more detail in the next section, *Univocity and Polarity*), Deleuze/Spinoza's Univocity is essentially an operationalization of the Taoist identity of opposites, polarity or nonduality and Nagarjuna's polarity of Emptiness and Form. This means that all dualistic notions, such as Hegel's dialectic, are *Ultimately* inadequate, i.e. meaningless at the absolute scope. This is why his criticism of Spinoza's Substance (which we are taking as the absolute scope) for neglecting the negative or oppositional element of the dialectic, entirely missed its mark. And indeed, Spinoza's absolute is only positive in the sense that it is no longer negative, disastrously regressive, oppositional and relative. It is the positive infinite in that it *affirmatively* "exists" *a priori*, or more properly, it is existence itself, along with all other relative terms and oppositions enfolded as ALL is ONE.[i]

In *What is Univocity?*, Metcalf says, "...with Univocity, representation is temporary surface effect. Univocity always keeps the representational plane of transcendence open to the sub-representative plane of immanence." And as Deleuze points out in *Difference and Repetition*,[ii¥] "Forms of the negative do indeed appear in actual terms and real relations, but only in so far as these are cut off from the virtuality [immanence] which they actualize, and from the movement of their actualization." In other words, forces of

[i] And we will find, as we have already briefly seen, that the rational numbers, with their "violation of the closure property" of the integers and natural numbers, also operate no longer on the positive/negative opposition of the integers, but on the "intensive forces" of the infinite space between "immanent-zero" and one, the sub-representational realm beneath the numerical identities of the Natural numbers and the transitive integers.

[ii¥] p207, qtd in Metcalf.

opposition and negation are "temporary surface effects," and occur only in transitive representational ignorance of the immanent forces (the inter-expressive cultivating thirds) that allow for the emergence of real and relative polarity and difference in the first place. And as we will see in much more detail in *SpinbitZ: Volume II*,[i]* even forces of immanence in physics are always transcendent or emergent when conceived or perceived at any particular scale, level or "plane," i.e. at the relative scope.

Deleuze describes forces of Univocity as *intensive*, as relative and inter-expressive degrees of sub-representational power emergent from the infinite difference which monads can enfold as a singularity.[ii] And, as Metcalf says in her article *Force Relations*, "There is no opposition to other degrees since they are all singular. Each is positive, singular intensity." Clearly, however, there is relation and polarity at this level of univocal forces, but this is exactly the point. The forces of Univocity are the modifications and relations on the relative plane of immanence, the cultivating third which allows opposition to emerge and which allows its poles to *really* inter-relate and inter-oppose.

Metcalf continues, "All intensive forces fit together without opposition or lack, because they are singular degrees of real distinction, ontologically one." This brings us to a fascinating correlation with a cutting edge model of fundamental physics, called Sorce Theory,[iii] which we will explore in much greater depth in the *SpinbitZ: Volume II*.[iv] Similar to Deleuze's forces of Univocity, Sorce Theory's "**s**ingular" f**orce** (sorce) of pressure, emerges into opposition (negativity) only through positive differences in relation, i.e. polarity. This polarity is the distinguishing feature of the forces of electro-magnetism, and we will examine in *SpinbitZ: Volume II* how the polar and indeed univocal forces of electro-magnetism are immanent, or fundamental to those seemingly monistic forces such as the extremely weak force of gravity.[v]

"However," Metcalf continues, "Univocity includes both a plane of transcendence and a plane of immanence. Now, the plane of transcendence is not cut off from its source. With Univocity, representation is actualized in really distinct worlds that remain open to all the singular forces of intensity." Perhaps contrary to Deleuze, it is not quite so simple a matter as to merely switch dualistically between intensive and oppositional forces when moving

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[i]* see *Sorce Theory: Unlocking the Basement* .

[ii] Just as the unit-identity in Interface Mathematics enfolds the infinity of the immanent pole within it (which the ratio breaks open again in its "violation" of "unit-closure") as it is first selected from the immanent-transcendent axis as the defining scale in the operational interface between mathematics and reality.

[iii] Sorce Theory is a purely causal unified field theory. See www.anpheon.org .

[iv] Which currently exists in the unpublished paper titled, *Sorce Theory: Unlocking the Basement*

[v] electro-magnetism is around 10^{40} times stronger than gravity

between these two levels. And, as we should by now expect, this is yet another polarity, because the intensive and oppositional (which are also the continuous-inhomogeneous, and discrete) are symbiogenetic and recursively emerging along the Immanent/Transcendent axis, as we will see in *SpinbitZ: Volume II*.

But Deleuze is reacting against the dualistic tendencies and biases at the level of representation or individuation.[i]* Specifically, Deleuze targets Hegel's absolutization of oppositional and representational forces at the expense of the intensive and sub-representational forces of Univocity, polarity and nonduality. This feature of Hegel's thought[ii] Deleuze naturally calls "infinite representation," since infinity, or unboundedness, is the quantitative aspect of the absolute scope. Deleuze is clearly, therefore essentially rejecting Hegel's absolutized representation in the forces of opposition in his dialectic.

In conclusion, Deleuze is correct to criticize Hegel there, but he draws perhaps too simple an alternative between merely two planes, as we will see. It is possible also, that Deleuze intends, by his planes of immanence and transcendence something more akin to our immanent-transcendent omni-axis, in both its immanent and transcendent aspects.

Univocity and Essence

> *Essentialism: No one is sure quite what, in essence, it is, but it makes a great insult.* — McKenzie Wark, *Dictionary of Received Ideas*

One of the key existentialists, Jean-Paul Sartre—in his focused reaction against the exoteric, or the "received ideas" of "rationalism" or Platonism from his era—converged on a very simple definition of existentialism as the notion or belief that "existence *precedes* essence." This is a simple reversal of the essentialist notion, attributed to Aristotle,[iii] that "essence *precedes* existence," and this notion can serve as an orienting generalization for our definition of essentialism. As should be directly clear, however, if either essence or existence "precedes" the other—at the absolute scope, as this is indeed taken—then we have a reductionism and a monism, not a nondualism.

An essence, in the traditional sense, is basically a platonic form, or an eternal and perfect template and category for the instantiation of always

[i]* …or cognitive nucleation, see Spinoza's Attribute Polarity and "The Nucleation of Observability", p486.

[ii] at least where it interfaced with Hegel's failed attempt to find the "plane of consistency" in Spinoza's thought.

[iii] if problematically, as we will see below.

imperfect manifestations. The encyclopedia entry on the subject defines an essence basically as a category with a finite number of properties which *completely* defines its instances.[i¥] This is a form of numerical identity or an absolutization of a concept or category, and, as we have seen, this is an explicitly invalid operation in the Univocity Framework and Deleuze's univocal and essentially nondual reading of Spinoza. As we should by now expect, this is brought about by a transcendent-bias. As Metcalf notes, "This is the Representation of numerically distinct substances which can share a common concept in the same essence. These are the forms and subjects of closed Representation on the plane of transcendence cut off from the plane of immanence."[ii¥]

But Deleuze/Spinoza's univocity denies the principle of the same, or the generality of the concept, that would precede and govern its real instances. As Metcalf says, "For Spinoza's Univocity there are no substantial or essential forms. They always come in compositions of complex infinities."[iii¥] Indeed, univocity, with it's positive or deep infinity and uncountable I/T axis, shows that all instances are necessarily and fundamentally different from each other and that there are necessarily an infinite number, or numberless details that would define the "essence" of any "instance," and make it *really*, inter-expressively, different and relative to any other.[iv*] This is part of Deleuze's project for undermining or counteracting the forces of closed Representation (e.g. the transcendent-bias, or the "plane of transcendence" cut off from the plane of immanence) which give rise to essentialism and Platonism, and this essence as infinite depth is also found in Leibniz's "hyper-essentialism" (note the Principle of Absolute Reversal in action with hyper-enacting the property of essentialism to arrive at its opposite).

But Deleuze shows us that Spinoza added something new to the traditional definition of 'essence.' That something new is a "reciprocity" (i.e. a polarity),[v*] says Deleuze, between the essence and the existence of the modification itself.[vi¥] This polarity means that essence cannot be separated from existence in order to precede it in the first place. In Spinoza, there is no longer the dualism between the perfect realm of essences and the imperfect realm of real manifestation.

Essence, for Spinoza, is the property "wherewith everything endeavours to persist in its own being."[vii¥] Spinoza's essence is an inseparable aspect of

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[i¥] Wikipedia: essentialism

[ii¥] Beth Metcalf, *The Immanence of Univocity*

[iii¥] Deleuze, *A Thousand Plateaus* p.254, qtd in Metcalf, *The Immanence of Univocity*

[iv*] See Univocity as Deep Infinity: Prigogine and Leibniz (p182) below.

[v*] See Spinoza's Attribute Polarity and "The Nucleation of Observability", p486

[vi¥] Deleuze, *Spinoza Practical Philosophy*

[vii¥] Ethics, Part III VII. "The endeavour, wherewith everything endeavours to persist in its own being, is nothing else but the actual essence of the thing in question."

modal existence which appears surprisingly modern in its approach. It is a mere tendency of modal existence to "persist in its own being." Today this could be called "homeostasis," or even a "strange attractor" from complexity science.

This is an extremely modern, and anti-platonic notion of essence as emergence and homeostasis, not a Platonic essence as a Form separated from its expression or existence. Thus, in Spinoza, essence does not precede existence, but is reciprocal, or symbiogenetic with it (i.e. nonduality or polarity). With Spinoza's reciprocity of existence and essence and his univocal infinite difference, this template kind of one-way connection, of essence manifesting and directing individual existence, is broken. He was not conceiving of essence as a numerical identity, but univocally as the inter-expressivity of infinite difference, i.e. as infinite existence itself as it manifests in the bounded forms of modifications. And hence, Spinoza, for Deleuze, is no essentialist.

Recall that, according to noted historian of philosophy Will Durant,[i] it was Hegel's neglect of Spinoza's essence as the active property of existence to "persist in its own being" that led him to taint the whole of academia with his false assumption that Spinoza's Substance/God was passive, lifeless and rigid. Spinoza's essence is not our modern notion of a rigid, Platonic template-Form to which malleable, fallen matter must con-form, but an active tendency of self-persistence and growth potential, the precursor of Fichte's *Ich*, "Schopenhauer's 'will to live,' … Nietzsche's 'will to power,' and Bergson's *élan vital.*"[ii¥]

Under the exoteric forces of Representation, the terms have changed in meaning through subsequent readings and in different contexts. Conceptual differentiations have occurred and subsequent interpretations have placed earlier thinkers on either side of a dichotomy they never held. Spinoza simply held no ultimate, foundational or reductionistic distinction between existence and essence. For Spinoza, essence did not precede existence. The essence of Spinoza's Substance was existence itself ("existence pertains to its essence"). Indeed, Nietzsche called Spinoza his metaphysical predecessor (along with some of the pre-Socratics, such as Heraclitus) and he was a key proto-existentialist in this sense, as well as others.

The point of the univocal reinterpretation of essence, is to re-integrate the essence/existence distinction and correct the historical errors of alignment brought about by the exoteric and lowest-common-denominator forces of Representation. These forces have put Spinoza on the wrong side of an essence/existence distinction he never held.

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[i]* See Spinoza's Univocity, p158.

[ii¥] Will Durant, *The Story of Philosophy*

Furthermore, at the absolute ineffable scope, as we will see in greater detail below, all distinctions are moot and hence it is meaningless for any property to precede any other. Any such precedence would be a monism and tacit dualism between the absolutized property and its antithesis.

Essence is the Latin attempt at interpreting Aristotle's puzzling *to ti een einai*, and it is assumed by exoteric academia that Aristotle was an essentialist in that he took essences to constitute reality as it is in itself.

But Spinoza appears to disagree with the idea that Aristotle was an essentialist, especially given his "hylomorphism." Indeed, in Spinoza's rough draft of the *Ethics*, the *Short Treatise*,[i¥] he seems to be taking a stand *with* Aristotle, but *against* the Platonic separation of formal essence and existence.

> Now, in the first place, it cannot be rightly said that there is confusion in Nature, since nobody knows all the causes of things so as to be able to judge accordingly. This objection, however, originates in this kind of ignorance, namely, that they have set up general Ideas, with which, they think, particular things must agree if they are to be perfect.

When Spinoza says, 'Ideas,' we can note the equivalents as Forms, essences, absolutized concepts, or numerical identities. He continues:

> These Ideas, they state, are in the understanding of God, as many of Plato's followers have said, namely, that these general Ideas (such as Rational, Animal, and the like) have been created by God; and although those who follow Aristotle say, indeed, that these things [essences, Forms, Ideas, etc] are not real things, only things of the mind, they nevertheless regard them frequently as [real] things, since they have clearly said that His providence does not extend to particular things, but only to kinds; for example, God has never exercised His providence over Bucephalus, but only over the whole genus Horse.

In other words, Spinoza is saying that Aristotle's expressed view is that essences are mental categories, generalizations over many varied instances. Thus, Spinoza says, although Aristotle was not a metaphysical essentialist, his followers exhibited the trait despite stating otherwise. That would be a prime example of the "traditional representational forces" of exotericism or orthodoxy in action in the 17th century followers of Aristotle.

In the chapter on *Spinoza's Attribute Polarity*, we will see the ontic aspect of the attributes as "formative protocols," as opposed to the "descriptive protocols" of the epistemic.[ii] These formative protocols are not "essences" in their current Platonic connotation as Forms, numerical identities, or

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[i] ¥ Also called the "Short Treatise on God, Man, and His Well-Being," see: http://www.yesselman.com/ShortTreatise.htm)Spinoza

[ii] Or the sub-representational vs. the representational, respectively.

pregivens, but rather they are obvious truths about polarity, such as the symbiogenesis of within and without, and the homeostasis of "nucleated" organisms. It is essentially a nondual (and post-metaphysical) reading because polarity is shown to be the emergent, not pregiven, meaning of the distinction of the attributes at both representational and sub-representational levels.[i]

Polarity and Univocity

Polarity is the essence, or defining feature of the nondual and of univocity. And univocity, we will see, is the very limit of polarity; where polarity (the core relation of the relative) self-referentially applies itself to itself to form the absolute scope in identical opposition to the relative. This is where relative thought grounds itself in its engendering other; its identical-opposite which gives it context and meaning; the absolute.

There are two basic directions of polarity in univocity; horizontal and vertical. These correspond to polarities *aligned*, but not identical, with the immanent-transcendent and the transitive axes, respectively (See the Main VCS diagram (Figure 6, p141)). We could also, then, call them *transitive* and *immanent-transcendent* polarities, or rather, *transitive* and *holarchical* (at least when neither term enters the absolute scope). For our purposes, because horizontal and vertical are simpler, and also generally sufficient, this will be the common usage when referring to directions of polarization in the Univocity Framework.

Horizontal or Transitive Polarity

We have already seen many horizontal, transitive polarities at work so far. These include all dualities or *oppositions* that emerge at the same level, or transitive-plane, in the holarchy of emergence, such as mind/matter, inside/outside, up/down, left/right, good/bad, etc. Horizontal or transitive polarity emerges from the cultivating third (the triunity manifesting into polarity) of the sub-representational realm where "divergence is affirmed and disjunction becomes a positive synthesis…[where] all events, even contraries, are compatible,"[ii¥] or inter-expressive.

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[i] Note that we can have no absolute truths of the sub-representational, or any level, nor are our concepts themselves, including the concept of sub-representation (ontic), subrepresentational. They merely *point* to sub-representation to break out of the forces of closed Representation which I show possess a transcendent bias which in turn forces a foundationalist reading of Spinoza as an essentialist and this in turn forces an idealist, or epistemic-absolutist counter-reaction, the beginnings of which we see in the Leibniz/Kant/Hegel hermeneutic trajectory. It is this historical trajectory, appropriated into orthodoxy as a representational reaction to the incomplete project of rational-empiricism (or modernity) itself, that Deleuze rejects as a distortion of Spinoza's Univocity.

[ii¥] Deleuze, Logic of Sense, p177. Quoted in Metcalf.

"Vertical" Polarity: The Polarity of Polarity

"Vertical" polarities, similarly rely on emergence, but they are oriented in the very direction *of* that emergence—*inwardly and outwardly* in their holarchical embryogenesis. Therefore, generally, it is the case that a "vertical" or immanent/transcendent polarity is also a binary section of a much larger holarchy. A key example of this type of polarity is the ontic/epistemic where the epistemic, or representation, is necessarily a subset of sub-representational reality, the ontic,[i]* yet it transcends it in emergence into true, unpredictable novelty.

Univocity itself, however, can be seen as a vertical polarity, in that it is the application of the concept of polarity, or relativity, to itself, in order to reach its opposite in the absolute or the "axis of Tao" which enfolds and unfolds all difference and polarity. In the same way that difference requires a deeper level of inter-compatibility or inter-expressiveness, so relation, at any level requires a deeper, more absolute, level of unity within which to inter-relate or be understood. This gives us an immanent direction for the absolute scope, but there is also a transcendent direction. Yet, again, the absolute scope of the infinite cannot be reached given that it is the openness of emptiness or unreachability itself. And in this same way, relativity itself requires the absolute, represented operationally herein, in both vertical directions, by the ONE-ALL tautology of the immanent-transcendent omni-axis. And, recall, this is also another expression of the principle of nonduality[ii]* with relativity being a function of *form* and with the absolute as the infinite depth of *Emptiness* (immanent/transcendent omni-axis), breaking away the ground of any absolutized substrate of form or relation.

Because this necessary ground of inter-expressivity is conceived of as within, it is common to assume that the absolute scope itself is also simply within. But, as we have seen, the identity of opposites as it unfolds into our principle of immanence in transcendence, as well as our principle of absolute reversal, precludes such a mono-polization of the immanent over the transcendent in the absolute scope, or vice versa, as is more often the exoteric case. It is also simple to see that there is a within everywhere in the infinite without, and thus as well in all forms of transcendence. There is always immanence in transcendence, and vice versa, because both occur on an infinite axis where each is relative to the other.

It is for this reason that vertical polarity of univocity is not necessarily *identical* with the immanent-transcendent axis, though conceptually aligned with it. The vertical polarity of the absolute and relative scope, for example, is not a polarity between a transitive plane and the immanent causation

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[i]* See, Univocity and the Vertical Ontic/Epistemic Polarity *(p176),* below.

[ii]* See the previous section, Univocity: Monism, Polarity and the Nondual, p156.

within, but between the transitive/relative and the infinite immanence *and transcendence* of the immanent-transcendent omni-axis itself. It is the polarity between polarity-transitivity-relativity and the ineffable tautology of the ONE-ALL.

Univocity and the Fundamental Question

With univocity as the polarity of polarity—where the relative scope, in the very same act, reaches for and creates its context and engendering other in the absolute scope—we can see the very essence of the "fundamental question" which asks the ultimate "WHY" of thingness and relativity itself. The fundamental question asks "Why does anything (or thingness itself) exist at all?" and "Why not 'no-thingness'?". This is the very act of the relative scope in reaching for its self-defining context. This ever expanding context is the core of the relative scope, so it is fundamentally intrinsic to the relative scope to ask questions of its own context. The relative scope asks the WHY-relation of its own self. When it tries to grasp itself as a whole, it cannot do otherwise than to seek its context which gives definition to wholeness itself. This polarity of context and wholeness is the outside emphasis of the polarity of parts and wholes which necessitates the holon: the part-whole which is always a part of another whole and is always made of parts which are also wholes.

But thingness and no-thingness are two sides of the same coin, just as are the absolute and relative scopes. They are ultimate thesis and its relative antithesis. Because, however, this is the relative scope itself seeking its identical opposite, we can go no further than their synthesis in univocity, and the absolute scope must be maintained in the purity of its concept, free from relativizing and colonizing poles of other (subordinate) concepts which would seek to absolutize at the expense of their own engendering others. The absolute scope must remain in Emptiness such that the duality of monopole-ization cannot occur, for when it does, it is no longer the absolute scope, yet the concept which reduced it to relativity is still assumed absolute. This generates the all-to-common con-fusion of scope at every absolutization of a relative concept.

Univocity and the Vertical Ontic/Epistemic Polarity

Before representation can "reach" the unreachable absolute in its aspect of immanence it must pass through and affirm its source; sub-representation. Representation is the nursery of reason. It is the emergent realm *into* which all concepts and percepts are born; a realm which they inter-expressively co-create through the cultivating third of their source. The source of representation is its inverse-identity, sub-representation": together, sub-representation and representation are essentially the ontic/epistemic

polarity, respectively, and they are both purely (and infinitely) relational.[i] Before univocity can "reach" the unreachable absolute in the immanent direction, then, it must first orient in the relative vertical polarity of the ontic/epistemic.[ii]

Through the identity of opposites in the ontic and epistemic we can see also that ontology is epistemic and epistemology is ontic. In other words, speculation about the nature of reality is necessarily representational, and representation is necessarily real. Or even simpler, the map of the territory is a feature of the territory itself.

The commonplace representational conflation between the map and the territory is perhaps a main cause of our tendency to think that ontology (the study of reality) *is* the study of the absolute scope, and to cast out relative truths about relative reality when we merely want to proactively eliminate its absolute truth claims (*absolutist* ontology). See Figure 9, below.

Figure 9: Ontic-Epistemic Polarity: The ontic-epistemic polarity reminds us that ontology is a form of knowledge (the epistemic) and that epistemology and all other forms of knowledge, are fundamentally real (ontic).

[i] …or taken to its limitless limit, the absolute/relative polarity.

[ii] The dialectic must demand that even the dialectic has its opposition, otherwise it is an absolutization of the relative operation of the dialectic itself. The trick is to shift from the relative scope, with its infinite holonic and operational transcension and immanence, to the absolute scope with its "ALL is ONE," nondual unity, enfolding and unfolding all polarity and relativity.

Hegel's Dialectic vs. Univocity

> *...when there is the triumph of reactive forces, then there are relations of opposition and negation.* — Beth Metcalf, *Nietzsche's Univocity*

One very subtle violation of the Univocity Framework[i] may be found in Hegel's use (or abuse) of the concept of the "dialectic." Hegel takes issue with Spinoza, recall, claiming that Spinoza's system is rigid, and that it does not allow negativity, or "the forces of opposition," as Deleuze might say, into his "substance."

Hegel says in his *Science of Logic*:

> ... with Spinoza, substance and its absolute unity has the form of an inert unity, i.e. of a unity which is not self-mediated, of a fixity or rigidity in which the Notion of the negative unity of the self, i.e. subjectivity, is still lacking.[ii¥]

As we will see,[iii*] the properties of infinite or absolute unity, in Spinoza or anywhere, do not allow for the relative term-inals or mono-poles of polarities such as inert vs. active, or rigid vs. fluid. Hegel is here supposing, perhaps (to give him the benefit of the doubt) that Spinoza is absolutizing *finite* unity without taking into account the ineffable properties of the absolute.

If, however, in the Univocity Framework we take Spinoza's Substance as immanent aspect of the absolute scope in polar relation to the relativity and dependence of its modes, then the functions of the relative scope, such as polarity and opposition, simply cannot otherwise apply. This is because the epistemic absolute scope was generated from the relative scope as its engendering other, to give it context in its identical-opposite. If we give it properties of relation, such as opposition and negation (or subjectivity vs. objectivity), we have merely transposed it back into the relative scope, negating its function and meaning, and we end up in infinite representation and absolutized relation. The absolute scope, recall, is not a place; it is not a stuff or a substance, in the common sense of the word. It is merely a category in the mind to keep the relative scope open to its identical opposite in Emptiness, to enforce the nondual realization of the ineffability of ultimate reality and to hold open an epistemic "space" to ensure that no relativity can be taken as absolute, or vice versa.

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[i] A violation of this framework, recall, results in a reductionism, absolutism or foundationalism.

[ii¥] Science of Logic § 565

[iii*] See Infinite Unity: ALL is ONE, p240.

Hegel's insistence, therefore, that Spinoza's Substance neglects to take into account the forces of opposition of the dialectic, is a violation of nonduality and univocity. It is to confuse the absolute with the relative scope and to attempt to populate the absolute scope with one's favored relative concept, in this case, the dialectic and the "negative unity of the self." This is a relative absolutism because it forces a polarity (an opposition) *within* (not with) the absolute scope[i] negating the Nagarjunan-Spinozan-Deleuzian absolute/relative polarity in an absolutization of the relative.

Following Kant, Hegel's system is also tacitly an epistemic reductionism encapsulated at the level of representation and the absolutized individual identity. It neglects to include its opposite in the sub-representational and the pre-individual—the pre-self-conscious.

Univocity can be seen as the unity of the intensive and oppositional forces in an affirmative and symbiogenetic (and therefore positive) conceptualization, as opposed to Hegel's negative absolutization of the purely oppositional, and Representational forces of the self-conscious Dialectic.

Beth Metcalf explains it thus:

> Within Representation, there is merely an abstract differentiating process of similarities and differences, genus and species of numerically distinct substances. Whereas Deleuze's Univocity says being in one sense and that of which it is said is difference; Hegel's infinite representation says being in several numerically distinct senses and that of which it is said is internally related to the infinite variation of conceptual identity. They are not similar in any way. ... because Hegel never reaches the sub-representative forces of Univocity. DR264 [[as Deleuze says in "Difference and Representation"]], "The entire alternative between finite and infinite applies very badly to difference, because it constitutes only an antinomy of representation…. because both fail to capture the… sub-representative source.."[ii¥]

According to Deleuze, Hegel demands that beyond the oppositional or negative elements of the dialectic there can be only either a) pure undifferentiated Being or b) absolute nothingness, both of which Hegel rightly rejects. Deleuze sees this as a false dichotomy, however, and rejects these choices in favor of a positive view of infinity, or the absolute, which moves beyond representation and numerical distinction, or absolutized identity, and sees difference and unity as two views of the same absolute, the identical-opposites of the relative and absolute scopes. This can be seen essentially as a nondual view with its identity of form and Emptiness

[i] …recall that the absolute scope enfolds and unfolds all polarities

[ii¥] http://users.rcn.com/bmetcalf.ma.ultranet/index.htm

mapping to difference and unity, respectively, but also vice versa, at the absolute scope (given the PAR).

This "infinite representation," as Deleuze calls Hegel's use of the dialectic, is part of Hegel's "absolute idealism." The problem, as Deleuze sees it, is not idealism, per se, but that Hegel has absolutized and closed off the level of Representation and self-consciousness, and further that he has done so in a negative way as pure opposition. Deleuze sees Representation and the forces of opposition always as transcendental, meaning that it is essentially emergent from deeper levels of reality. In other words, it is always dependent and relative, not absolute and independent. The opposition of the absolute scope can only reflect back to the relative scope. But there is opposition of Substance, as the immanent *aspect* of the absolute scope, in the transcendent *aspect* of God, in the identity and tautology of the ONE-ALL.

Hegel's Dialectic as Performative Contradiction

It is simple to see Hegel's absolutized dialectic, in his criticism of Spinoza, in terms of a performative contradiction. The dialectic can be seen as a process of converting duality to polarity: thesis and antithesis, mapping respectively to the "positive" vs. the "negative" and unified inter-expressively in the cultivated third and "synthesis" in polarity. But the application of polarity, the dialectic, to itself produces the self-negation of negation or the self-negation of opposition. If polarity—or the negative and oppositional Hegelian dialectic—exists at the relative scope (as it must), then absolutizing the dialectic would mean applying the dialectic (or polarity) to itself. This in turn means that polarity can't exist without its opposite, non-polarity, the non-relative or absolute scope. The dialectical synthesis of the two, then, is Deleuze's inter-expressive Univocity and tautology of the ONE-ALL, the synthesis and identity of opposites of Unity and Multiplicity, the absolute and relative views of the absolute. To be sure, these are not *levels* of reality, but *aspects* of the same reality at all levels. That's why the ONE-ALL is a tautology, not a true opposition. It doesn't take us anywhere because there is nowhere else to go at the absolute scope. In this sense, polarity (relativity) is intrinsically self-transcending, and other-engendering of the concept of the absolute, but the opposition of the absolute can only return (through the PAR) the relative—and hence Substance turns on its modes.

And so, Hegel's absolutization of the dialectic[i] can be seen as a performative contradiction given that it fails to apply the dialectic to itself in order to give it context in its opposite—in order to really reach the unreachability of the absolute. But Hegel's representational and relative *oppositional* dialectic

[i] Perhaps only insofar as his mis-mapped and mis-targeted criticism of Spinoza is concerned.

fails even to transcend itself and reach the sub-representational *intensive* forces of univocity, let alone the absolute. Hegel's dialectic divides itself endlessly, indefinitely according to the oppositional forces of Representation and its numerical identities, never reaching the unity of the absolute which gives difference and opposition (polarity) its inter-expressive meaning. Like two opposing mirrors Hegel's dialectic remains trapped in self-conscious illusion and absolutized Representation, dualistic opposition and relativity. It never reaches the sub-representational or the plane of immanence. At this level, this plane of immanence, instead of negative oppositional forces transcending and negating each other, Deleuze sees forces of intensity, transcending and *including*, rather than *negating* each other.

Because the absolute scope (e.g. the nondual or the "axis of Tao") enfolds and unfolds all polarity, univocity is actually the positive negation, or the acceptance, affirmation and transmutation of opposition; the negation of negation in the positive infinite. The root-polarity, the positive infinity of esoteric rationalism, is the polarity of *polarity vs. non-polarity*—in other words, the relative/absolute polarity, the univocity axis or the dialectic of univocity whose synthesis returns us to the positive infinity (logical Emptiness) of esoteric rationalism. This is the root polarity because the absolute has returned home, from its journey through the world of form, the relative and sub-representational, to its engendering other in the ineffable absolute. The concept has returned to its source through the non-concept, the sub-representational or the plane of immanence. In this root conceptual polarity, where concept opens to its annihilating/generating antithesis/pre-thesis, the absolute unfolds and then enfolds polarity itself.

The relative, representational nature of the mind forces us to see even polarity itself in terms of the deeper absolute/relative polarity. To push it further, to demand that the absolute scope itself must have opposition (other than the relative scope itself, from which it was symbiogenetically born), is merely to fail to touch the absolute, to fall back into the relative across the root polarity/dialectic. In the terms of the Hegelian critique of Spinoza, Hegel is wrong to think that Spinoza's absolute-scope Substance has no opposition. Its opposition merely takes the vertical-polarity form of the concept touching and then reflecting off the aconceptual; form reflecting back into its own originating Emptiness, and vice versa. It cycles back vertically within the root polarity from Substance back into its modes, from the absolute to the relative scopes, and back again.

In Spinozan terms, Substance and its modes are the root polarity, the absolute/relative univocity dialectic or axis. To push this dialectic deeper is a scope con-fusion, a categorical error; to defy the relative nature of knowledge and the nondual and indeed to revert to the mythical, pre-Nagarjunan, pre-Kantian, representational absolute; the "holy grail of philosophy" that seeks operational and therefore relative absolutes.

In Leibniz-Kant-Hegel, the univocity pendulum has swung the other way, from the medieval *relativization of the absolute* in ascribing anthropomorphic qualities to God, to the post-modern *absolutization of the relative*, in lifting the properties of the dialectic (or hermeneutics, or social construction, or whatever) to the absolute scope. In the Univocity Framework, however, these two opposites, as all opposites, are seen necessarily as identically opposite anthropocentrisms. They both attempt to dissolve the core of nondualism in the absolute/relative polarity through conceptual encapsulation of the absolute in the relative, or populating the absolute scope with conceptual mono-poles, but from two different sides of the same operation. The Hegelian, post-modern, transcend-and-negate dialectic is the inverse identity of the pre-modern negative-regressive foundational infinite. They are both functions of the transcendent-biased modes of absolutized representation (relativity) and are therefore also epistemic absolutisms.

Univocity as Deep Infinity: Prigogine and Leibniz

Univocity can be understood much more clearly in its relation to deep (or positive) infinity. This is illuminated from the other direction by Leibniz—from the point of view of identity or similarity rather than difference—in his principle of the "identity of indiscernables." This is the idea that two things with *absolutely* the same properties are in actuality necessarily the same thing. The idea is that, at the very least, a mere difference of position in space of two otherwise identical entities (were this identicality otherwise possible) will manifest differences in expression, because every position in "space" is necessarily different from every other. According to Leibniz (and contra Descartes and Newton) the concept of space or extension, as an abstract, isometric (and perhaps platonic) Emptiness—principle of the same—imparting no *real, active/causal or physical* difference on objects or expressions located differently within it, is a superficial and misleading generalization, if taken absolutely. Space itself, according to this view, is composed of, or has the property of, infinite depth of real difference, infinite activity (anima) and infinite modification, very similar, in this sense, to the active properties of the modern "quantum vacuum," with it's "zero point energy." And therefore any particular region of space will impart its own unique properties, stemming from this infinite depth of active detail, upon objects located within it.

And even before Leibniz, Spinoza conceived of extension as an *attribute* of infinitely active Substance, i.e. the essence of Substance conceived and/or perceived from the outside.[i] In Deleuze's view of Spinoza, and similar to my

[i]* See Spinoza's Attribute Polarity and "The Nucleation of Observability", p486.

own interpretation, Spinoza's Substance is ''pure immanence,"[i] or what Spinoza called "immanent causation." As we have seen,[ii] however, Spinoza's Substance is more properly identifiable *not* as an immanent plane or substrate,[iii] because any substrate is necessarily a modality or relativity and Spinoza reached his Substance (absolute scope) through an "escape of the mode" and the infinite immanent regress of modality and the relative scope.[iv]* Spinoza's Substance, as an "escape" of the foundational, modal regress of the relative scope, therefore represents a final coming to rest in the *a priori* unity of deep infinity, i.e. the Immanent/Transcendent axis itself, and the absolute scope.

A fascinating modern correlation of this idea of univocity as deep infinity and Leibniz's "active space,"[v] can be found in the work of Nobel Prize winner Ilya Prigogine with his solution to the notorious ''arrow of time" problem in thermodynamics. The problem, simply put, is that the laws and equations of thermodynamics are too general to account for the ''arrow of time" that we experience and record in daily life. Because of this abstract, general (representational) aspect, the equations operate identically in both the forward and reverse directions and contain or express no arrow of time whatsoever.

Prigogine solved this problem through a concept he called "active-matter," which, as the identical opposite of Leibniz's concept of "active space," appeals (if unconsciously) to the positive infinity of esoteric rationalism in the sense that matter (the tangibility aspect of space) also has the property of infinite depth, activity and modification.[vi] Because matter, in this view, has the active property of infinite depth of detail,[vii] no finitely detailed law, equation, generalization or set of initial conditions (i.e., no principle of the same) can absolutely predict or determine the outcome of any sufficiently complex event, such as those in thermodynamics. And thus

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[i] As Deleuze called it.

[ii] And as will be discussed in greater detail in the section Leibnoza Von Spinbitz: An Identity of Opposites, p659.

[iii] …although a modal substrate is perhaps not quite what Deleuze meant with his "plane of immanence."

[iv]* Recall the transcendent-bias and the pre-rational, negative/regressive infinity discussed in the section, Foundationalism, the Infinite Regress and the Transcendent-bias, p91.

[v] …though Leibniz consciously dissolves the absolute distinction between space and matter.

[vi] Space and matter, then, as should be expected, present no real dichotomy in Nondual Rationalism, but merely a polarity based on solidity or tangibility of existence at the interface with our senses. This is why open air, which we now know is full of "stuff" is generally considered a space. The concept of "outer-space" is a new one to make a more refined distinction between a new kind of space that is too intangible to be detected directly, such as with wind, by our senses.

[vii] Recall our Principle of Nondual Rationalism, infinite division equals indivisibility, and how this would naturally seem to lead to a "unified" view of reality.

"time" and process will necessarily deviate (if sometimes imperceptibly) from the physical laws, whether the equations are run forwards or in reverse. Indeed, this is the general category into which entropy falls and it is this constant deviation from the equations of thermodynamics (run forward or reverse) that is the general direction or "arrow" of time.

Univocity and Immanent Determinism

Spinoza's "immanent determinism"[i]* can be seen in a very similar light, and this is really the only way to consistently and coherently interpret his words on the subject. Spinoza is generally considered a radical determinist, even a reductionist—where all events are *ultimately* "determined," necessary or reduced to their indwelling or immanent causes. As Matthew Stewart points out in *The Courtier and the Heretic*:

> One of the most notorious propositions of the Ethics is: "Things could not have been produced by God in any manner or in any order different from that which in fact exists." This is a logical inference from the proposition that the relation of God to the world is something like that of an essence to its properties [recall Spinoza's essence as existence]: God cannot one day decide to do things differently any more than a circle can choose not to be round, or a mountain can foreswear the valley that forms on its side. The view that there is a "necessary" aspect of things may be referred to by the sometimes inappropriate name of "determinism."

But, as Stewart goes on, such a view of Spinoza as a mere determinist or reductionist, is a very superficial reading. This is precisely because Spinoza takes his determinism to the absolute scope of immanence—to the essence=existence of God and Substance, where it rebounds and reflects into radical indeterminism[ii]—Spinoza is at one and the same time, in this very sense, a radical determinist and an indeterminist. Stewart says:

> Of course, Spinoza acknowledges, in the world we see around us, many things seem to be *contingent*—or merely possible, and not necessary. That is, it seems that things don't have to be the way that they are… In fact, Spinoza goes on to say, *every* particular thing in the world is contingent when considered solely with respect to its own nature. In technical terms, he says that "existence" pertains to the essence of nothing—save God. Thus, at some level, Spinoza stands for the opposite of the usual caricature of the determinist as reductivist, for, according to his line of thinking, we humans are never in a position to understand the complete and specific chain of causality that gives any individual thing its necessary character; consequently, we will never be in a position to

[i]* See Transcendental Determinism and the Captive Will (p643), for a discussion of Transcendental Determinism and the problem of the freedom of the will, which it causes..

[ii] Recall our principle of absolute reversal…lasrever etulosba fo elpicnirp ruo llaceR

> reduce all phenomena to a finite set of intelligible causes, and all things must appear to us to be at some level radically free. (In this sense, incidentally, he should count as a radical empiricist.)

This fundamental inability of Representation to reach or encapsulate the deep infinity of Nature, i.e. to bound the unbounded, is a simple function of the polarity of the finite and infinite, or the relative and absolute scopes, respectively, as we have discussed. Any process that has a beginning or an end, is necessarily relative, and therefore finite or bounded, even if indefinite, with bounds yet-te-be-determined.[i]* The simple point is that just as the finite cannot overtake the infinite (you can't count to infinity),[ii] so the relative scope cannot encompass or equal the absolute scope in its immanent or transcendent aspects (this is an explicit function of the univocity-framework and the different properties of horizontal vs. vertical polarities at the absolute vs. relative scopes, as we will see).

In this way, unbounded or "infinite determinism"—determinism at the absolute scope of deep infinity—is identical to indeterminism, in that it necessitates the inability to *absolutely* know the (infinitely detailed) causes of any event/object. As such, it is logically, rationally and empirically impossible to predict or determine *absolutely*, the outcome of any process and to put the ultimate causes into a finite set of intelligible laws, such as those of thermodynamics. In this sense, Spinoza, in the 17th century, had already solved the "arrow of time" problem, implicitly, in his radical (absolute scope) "determinism." It just took exoteric science 300 years to catch up. Indeed, Spinoza's modes, as seen through the attribute of Extension, are already composed of Prigogine's 300 year-old active matter, and they already existed in Leibniz's decades-old active space, i.e. Extension itself.

The identity of opposites (with its implicit Principle of Absolute Reversal), and the Univocity Framework, necessitate that, at the absolute scope, infinite determinism and indeterminism are merely two ways of stating the same thing. This is because, as we have seen, at the absolute scope of the modifier 'infinite,' all polarities are enfolded as one. In other words, the concept of determinism itself (as all concepts) is relative and it has no *ultimate* (absolute scope) meaning apart from its (identical) opposite.

Therefore, we come to another resonating chord from our Principle of Nondual Rationalism, which itself reverberates from the ancient principles of nondualism, such as the identity of opposites. As will be explicated further through the Univocity Framework, this univocal essence of deep-

[i]* … i.e. a third order infinity (see Order 3: The Modal (or Bounded) Infinite:, p279).

[ii] Note that even children are operationally aware, at some level, of the absolute scope, when they jump out of the modal and relative games of magnitude invoking the modifier of, "I'm infinity!".

infinity in active-matter/-space *ultimately* (absolute scope) comes down to the following identity of opposites: infinite determinism = indeterminism.[i]

Principle 5: Chord 4: The Principle of Infinite Determinism (PID)

Infinite determinism equals indeterminism.

Explanation: Given the identity of opposites and the Principle of Absolute Reversal, determinism, when taken to its absolute scope, rebounds or reflects off the ineffable absolute into its identical-opposite. An infinitely deep determinism necessitates the inability to absolutely and completely determine, from any level or region of levels, the outcome of any event/object; Emptiness precludes the self-identity of the forms of time.

Symptomatology: Nomothetic vs. Idiographic Explanations

> *We will never find the sense of something….if we do not know the force which … is expressed in it. A phenomenon is not an appearance or even an apparition but a sign, a symptom which finds its meaning in an existing force. The whole of philosophy is a symptomatology…* — Deleuze, *Nietzsche & Philosophy*

An instance of these distinctions in action can be seen in the different forms of scientific explanation. Nomothetic explanations are general case explanations using laws governing and derived from generalized categories, whereas idiographic explanations recognize the immanent idiosyncrasies of the individual object or event and attempt to tell the story of that particular event/object. An example of a nomothetic explanation would be the mechanical laws of physics, such as F = MA, whereas an example of an idiographic explanation would be the explanation of a medical case file culled from an exhaustive examination of the patients history of symptoms; a symptomatology.

[i] …which we could denote with the simple hyphenated variant, in-determinism…

It may indeed be the case, given the transcendent bias, that the nomothetic explanation exclusively is imposed on the immanent world of the quantum because we expect things to get ultimately and categorically simple in our post-medieval and foundationalist scientific mind-set. Without recognizing the infinite difference of immanence (Leibnizian/Prigoginian active-space/matter), we can't see deviations from these categories and laws for what they are; emergent properties from immanent complexity. And so we assume that conceptual randomness, opposing our simplified categories, rules in this domain, rather than recognizing the limits of the nomothetic explanation and the need for the idiographic.

This is a classic example of the transcendent-bias in action. Given the Principle of Infinite Determinism, above, the resolution to the conundrum is simple. Embrace the immanence of univocity and there is no need to discard the idea of causation or determinism when our categories and laws give way to the idiosyncrasies of the individual object-event. The call for randomness, in every case, can be seen as the conflict and break-down of the nomothetic categories in the entropic face of infinite difference and idiosyncrasy. Randomness, then, calls for the idiographic methodology, in a univocal polarity of explanatory function between the nomothetic use of the principle of the same and the idiographic use of the principle of infinite difference.

Indeed, the laws were formed as general cases from a symptomatology in the first place. In our foundationalist mind-set we simply expected them to govern absolutized categories, with absolutized laws, rather than real idio-singularities of infinite difference in interactions of infinite detail.

The Univocity Framework, therefore, opens the way beyond the closed oppositional forces of the categories of Representation, to a recognition of the need for an evolutionary history—a symptomatology—for each individual "particle," in order to get a full account of the infinite determinism equals indeterminism of any single event-object, and indeed to account for the "arrow of time," in the eternal NOW. No two events are alike or ultimately predictable, not because there are no determining factors involved (i.e. randomness), but because there are *infinitely* many.[i] And again we can see here the polarity of the omni-non between the categorical forces of Representation and the acategorical imperative in the Univocity Framework.

Univocity and the Eternal NOW

The above is understood more explicitly as follows. As we have discussed, the absolute scope is best mapped (relatively) by the I/T omni-axis, giving us

[i] ...this is another instance of the omni-non...

the quantitative aspect[i]* of the ALL in the ONE. This omni-axis, when applied to the absolute scope of the aspect of duration or time, translates into the identity of opposites commonly called "the eternal NOW," or simply Eternity = NOW. This is also implicit in Spinoza's *sub specie aeternitatis*, and Spinoza's concept of immortality in the participation of eternity in the instant.

Deleuze explains this through a Stoic lens; "Univocity is the pure empty form of time (Aion). Sense is on the plane of Aion,[ii]* that pure instant which divides every present into both future and past directions at once."[iii¥] Eternity is the infinite transcendent pole (or directionality), of the absolute-scope of the temporal axis. And the "infinitely small" or sizeless irreducible instant, the NOW, is the absolute-scope of its immanent pole. Neither absolute pole—the eternal or the NOW—is reachable through any transitive, linear or finite (relative) means, such as multiplication or division into ever larger or smaller intervals of time, represented to the mind as either memory or anticipation. In principle, *any* interval, in space, time, or whatever, can be divided or multiplied further. This means ultimately that the linearity of time, i.e. the existence of a ''time-line" consisting of moments, one after another, from the past to the future, is a purely relative and sometimes representational function. Neither the past, the future or the ''time-line" itself, exist at the absolute (and sub-representational) scope. In the immanence of the eternal-NOW, there is no absolutely and transcendently predetermined future waiting for a "near eternity" to become the past. There is no inescapable predetermined chain of events or tireless iron grip of the dead hand of fate. At the absolute scope there is only the single irreducible and unreachable, yet ever-present and inescapable, NOW of existence, "nowing"[iv] in infinite difference and irreducible multiplicity for all eternity.[v] See, below.

As Bucky Fuller says in his *Synergetics*:

> The norm of Einstein is absolute speed instead of at rest. "At rest" was what we called instantaneous in our innocence of yesterday. We evolute toward ever lesser brain comprehension lags—ergo, toward ever diminishing error; ergo, ever diminishing misunderstandings; ergo, ever diminishing fear, and its brain-lagging painful errors of objectivity; wherefore we approach eternal instantaneity of absolute and total comprehension. The eternal instantaneity of no lag at all (529.31).

---

[i]* See the section on the Triune Infinite and specifically the "Aspect Infinities."

[ii]* The "mnemonic interface" discussed in Spinoza's Attribute Polarity and "The Nucleation of Observability", p486).

[iii¥] *Logic of Sense*, qtd in Metcalf

[iv] And "wowing," as Bucky Fuller would say.

[v] We can see here implicitly enfolded the opposite-identity of the noun-verb polarity which is a version of the deeper stasis-flux polarity.

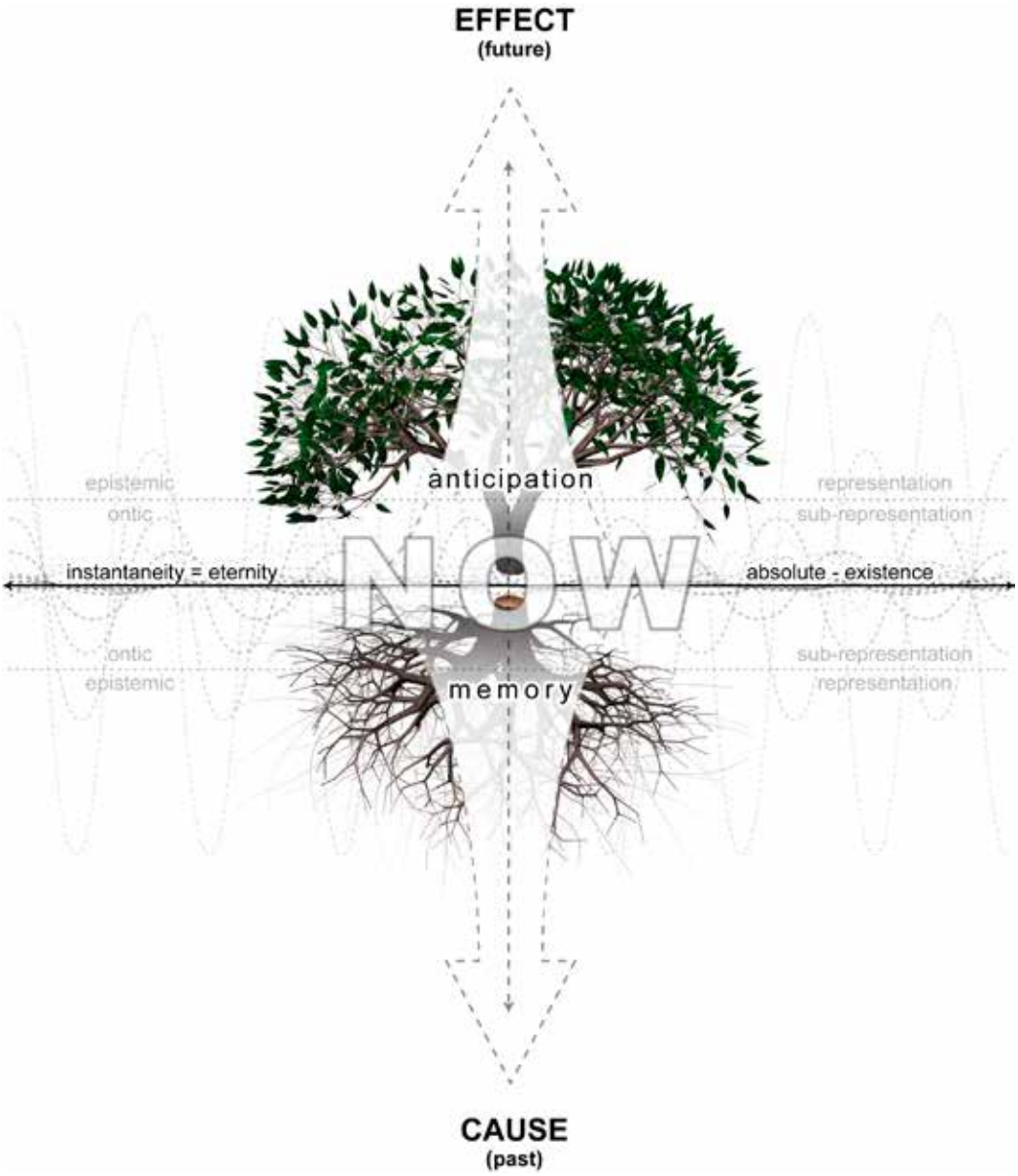

Figure 10: The Tree of Singular Time:
In the Eternal Now of the singular individual, the present alone exists yet it vanishes into immanent nothingness from any transitive frame of reference - the tree *seems* to vanish into the nothingness of the immanent singularity of the instant at the interface between the roots of the past and the branches of the future.

EXPLORING THE UNIVOCITY FRAMEWORK

In Nondual Rationalism, the principle of univocity is our primary interface or cultivating third between the fundamental polarity of scopes: the absolute vs. the relative. Because the closest relative-scope approximation of the absolute scope in the VCS is our immanent-transcendent omni-axis, and the best representation of the relative scope is the transitive-axis, (note: recall the VCS main graphic, p141), therefore the Univocity Framework also serves to regulate the interaction between the two primary "axes" of the Vision-Logic Coordinate System. Transitivity is where dualities appear, and they are resolved by the vertical polarity (e.g. in the various forms of dependent arising or emergence), represented by, or operationalized upon, the I/T axis.

The fundamental relativity—where the relative scope finally points outside itself to the absolute, forming the absolute/relative polarity of univocity and Nagarjunan nondualism—serves to balance the transcendent- and representational-bias and to deflect any unconscious attempt at absolutization by the relative (e.g. reductionism) by reminding us of its identical-opposite in the ineffable absolute. This includes absolutization of the immanent-transcendent omni-axis itself as actually *being* the absolute scope, rather than merely pointing to it as an enfolded and unfolded tautological aspect or identity in the ONE-ALL.[i]*

The Univocity Framework shows us that any absolutization of the relative scope—which would include any concept without its identical-opposite (such as matter, mind, or perspective vs. non-perspective)—is a contradiction in terms. This is the message of nonduality made explicit and operational in the Univocity Framework. Univocity, as the prime mediator or polarity between the absolute and relative scopes (e.g. between "Identity and Difference" or the "the One – All" (DR37) in Deleuze) maintains the essence of the nondual, prohibiting absolutization of the relative and epistemic (e.g. "the relativity of Truth") while opening up a space for the truth and necessity of the relative in ontological or metaphysical speculation.

It is important to keep in mind that the ontic (or sub-representation) is not the same as the absolute, but is merely the world of form (all of which is necessarily relative) in its real, as opposed to representational, aspect. And even while immanent (a plane of immanence), every form or mode in the ontic is necessarily always emergent, or transcendent ("transcendental

[i]* See the Order 2: The Aspect Infinite, p273.

empiricism"), given its relative existence, or "position," on the Immanent/Transcendent axis. Recalling our principle of immanence in transcendence, any position on the I/T axis is always both immanent and transcendent, depending on from where it is viewed. Therefore, while univocity opens the space for ontological speculation, it maintains the relativity of that space, in effect guaranteeing that any ontological speculation is necessarily relative and cannot be absolutized.[i]

For the sake of visualization we can imagine the two primary scopes of the Univocity Framework as forming two layers, one on top of the other (see, Figure 11 below). In this case we have arbitrarily represented the absolute scope as above, and seemingly transcendent to, the relative, which is half-true, but we must keep in mind that as much as the absolute is transcendent (which is infinitely so) it is also immanent (again infinitely so). And this is implicit in the relative representation of the absolute scope by the immanent/transcendent omni-axis as a whole, each pole of which is a directional aspect of Absolute Infinity, which epistemically is the quantitative aspect of the absolute scope.

When you conceptually "arrive" at infinity (the absolute scope) in either immanent or transcendent "direction" you have (necessarily) found the open-ended immanent/transcendent omni-axis itself. This is because the infinite (unbounded) cannot be a boundary (a relativity) on the omni-axis, or a point on the uni-axis (a unit of scale) that can be reached and surpassed, but must be seen (necessarily from the relative scope) as the infinite omni-axis itself. This is the main feature of absolute-scope polarities; necessarily containing (unfolding and enfolding) their identical-opposites, they are intrinsically identities, paradoxes or tautologies, such as "ALL is ONE" or "infinite division equals indivisibility."

[i] Thus Univocity actually enforces or enacts (operationalizes) the message of nonduality, and this is why it is the most effective core of any "Integral Operating System."

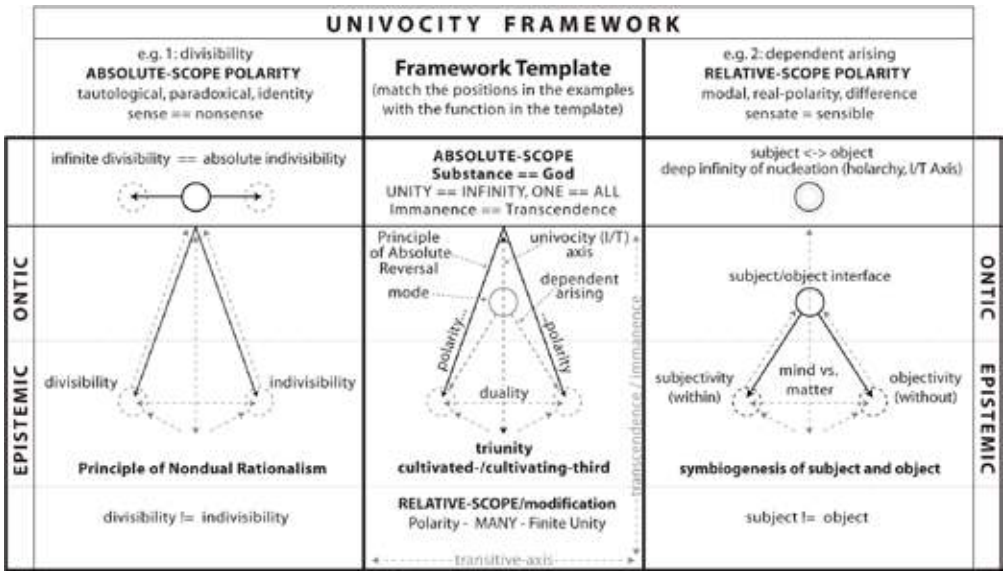

Figure 11: The Univocity Framework Template:
The center panel (B) of this graphic lays out the template for the side panels (A,C) which give examples of the framework in action.[i] Panel A shows an absolute polarity, which, of necessity contains its opposite and results in an identity or tautology. Panel B shows a relative polarity, which cultivates through triunity into a symbiogenesis or structural coupling at an interface. In the main triptych, the sections designated by the ontic/epistemic polarity are the relative scope, whereas the section directly above the relative scope is the absolute scope. The top-most section of the triptych describes each of the three panels below it.

The primary function of the Univocity Framework is to interface and mediate the absolute and relative scopes, therefore we can draw another axis (vision-logic level axis), the "univocity axis," between them, to show this interface, connection and orientation (the center vertical axis in the above diagram, and in the center of every "univocity pendulum"). However, as are all axes and real polarities, the univocity axis itself is fully operational only within the relative scope (the real world of form), as it points (but does not reach) outside itself to the absolute. The univocity axis merely serves to

[i] It is interesting to note the similarity of this diagram to an earlier dream of mine. In this dream, a dark bony woman was constructing and speaking a sign language with triangles and a pendulum form in the middle out of her many long bony fingers.

orient the relative and absolute scopes and to denote the vertical direction in the framework. In the relative scope, the I/T axis is aligned with the univocity axis, but again, both immanent and transcendent directions point (in their infinite aspects) to the absolute scope. This is because they deal with the omni/non polarity of the aspect of locality, rather than the transitive left-right types of polarities.

This aspect of the immanent-transcendent axis, where each pole points to the absolute scope, is contrary to the diagram which necessarily has to show one pole closer to the absolute scope than the other. In this case, it shows the immanent direction as pointing toward, or emerging from, the absolute scope. This is because we are counteracting the transcendent-bias and focusing on the ontic as the emergent triune-interface between the relative and absolute scopes. The point is that the epistemic is an emergent subset of the real-world of form, the ontic, but it is also true that the ontic is both immanent and transcendent to the interface of representation, or the epistemic. So in this sense, the epistemic can be seen as the triune interface between the immanent and transcendent aspects of the ontic.[i]*

Circles in the above univocity diagram denote modifications, or modes, while lines denote emergence or directionalities of thought. Solid lines (and solid circles) denote real, or ontic, directions (emergence or an actual identity) while dotted lines denote representational lines. The principle of Absolute Reversal (and the identity of absolutized opposites) is denoted by the triangular line that reflects off the boundary of the absolute scope, since relativities make no sense and have no function in the absolute scope.

The two examples (A, C) illustrate the two main kinds of polarity, absolute and relative, respectively. The absolute polarity, seen in the absolute scope level of example A, illustrates the seemingly "paradoxical" nature of absolute scope polarities, such as "infinite division equals indivisibility," and that the two poles (and the polarity itself) are illusory, or representational and relative aspects (dotted circles) of the same absolutized concept, e.g. divisibility. In example C, we have the relative scope polarity (a real polarity, as opposed to an identity or tautology) of the symbiogenesis of subject and object where the real duality is reconciled (and symbiogenetically emergent) by the cultivating third of the sub-representational (and immanent) "mnemonic primitives" at the "interface" between subject and object.[ii]*

These two examples are both horizontal polarities in the Univocity Framework, but we can also see the vertical polarity, or the holarchy of the ontic and epistemic (or the sub-representational and representational, respectively). As discussed, if a vertical polarity has one pole within the

[i]* see Spinoza's Attribute Polarity and "The Nucleation of Observability", p486.

[ii]* See Emergence, Mnemonic Primitives, and the Symbiogenesis of Subject and Object, p528.

absolute scope, we have a violation of the Univocity Framework and the principle of absolute reversal. Any mono-pole taken to the absolute scope necessarily reflects into its opposite in the relative scope. The only polarities allowable at the absolute scope are those that have both poles (identical-opposites) in the absolute, and these break down to tautologies, seeming paradoxes and (numerical) identities, and are thus not real polarities or differences.

The Axis of Univocity

In the Univocity Framework graphic above we have the two fundamental scopes, the absolute and the relative. Between these two scopes we have stretched another axis, the univocity or "primary scope axis." Each of these scopes has fundamentally different conceptual and operational properties. But further, any polarity orthogonal or perpendicular (horizontal) to this primary scope axis between the absolute and relative scopes, will be confined to one of its primary poles, i.e. either the absolute or the relative scope, and will be subject to the operations of that level. At the absolute scope, the polarity will be "nonreal," and non-relational, or merely tautological (an identity), whereas at the relative scope, the horizontal polarity will be a real difference, an interface of some sort, like that between left and right, up and down or subjectivity and objectivity.

The axis of univocity represents this primary ontic relation between the absolute and relative scopes, and what it ultimately means is that the absolute and relative are one, but only "seen" or addressed differently via different conceptual scopes due to the polar nature of human comprehension itself.[i]* This ONE-ALL relation of univocity ultimately means that unity can only be understood as identical with infinite difference, which brings us back to our identity of opposites in the understanding of univocity as a function of the polarity of polarity.[ii]*

The absolute level is the level of unity and identity and (in explanation of Wittgenstein's logic of axioms, where axioms are always tautologies) this is the level of tautology and paradox. For example, given Leibniz's Identity of Indiscernables as expressing the identity aspect of univocity, the only "thing" that can be absolutely identical to anything else is that "thing" in relation to itself. An orthogonal polarity at the absolute scope, therefore, will be merely a dual or cyclical representation of the same absolute identity, i.e. a tautology, whereas a polarity at the relative level (the level of polarity itself which we project on the absolute in the primary polarity of univocity) will be a "true" (or non-tautological) polarity, i.e. a real difference in dependent

[i]* See the section, Phase TWO: Polarity and the Opposable Thumb of the Mind, p112.

[ii]* see the sub-section above, "Vertical" Polarity: The Polarity of Polarity, p175.

arising,[i] e.g. the symbiogenesis of subject and object, the dependent arising of mind and matter, or Fuller's "unity is plural and at minimum two," which says that any mode (finite unity) necessitates, at least, an inside and an outside.

The Univocity Framework In Action: Leibniz and the "Principle of Macrocosm and Microcosm"

Perhaps the best way to really understand the Univocity Framework is to see it in action in the detection and correction of errors in univocal or nondual thinking. In *The Courtier and the Heretic*, Matthew Stewart provides a ripe example from the metaphysics of Leibniz. In Leibniz's monadology, a monad or individual is, first and foremost, immortal, and hence is conceived as a substance, complete or *independent* unto itself.[ii] Because of this need in Leibniz's "popular religion" of his monadology for a *personal* or individual immortality, monads are famously considered "windowless" and incapable (and not in need) of interacting with their environment including any other monad. They are, in essence, *independent* numerical identities or absolutized logical and metaphysical categories incapable of dependent arising. Stewart says:

> In order to rid the world of Spinoza's theory of mind [as modal, relative and hence mortal], Leibniz must first annihilate Spinoza's idea of Substance. For, in declaring that God alone is Substance, Spinoza reduces human beings to mere modes of Substance, and thereby renders our minds material and mortal [[dependent]]. Leibniz's strategy is therefore to replace the idea that God alone is Substance with the claim that there is a plurality of substances in the world. By identifying the mind with these new substances, Leibniz intends to secure for humankind a degree of indestructibility, power and freedom that his rival philosopher associates only with God [[independence]] (p245).

Leibniz is here misunderstanding (or purposefully neglecting and misrepresenting, as is often the case with Leibniz) the inherent polarity and identity of opposites, of Substance and its modes, the ONE and the ALL of its infinite multiplicity, and the absolute and relative scopes of Substance. For Spinoza, there is only Substance and its modifications, and modifications are not independently real, just as forms have no independent and inherent identity in Emptiness. A mode *participates* in immortality (*sub specie aeternitatis*) because it is an *aspect* or *modality* of God and Substance. To

[i] Note that with univocity the relative and the absolute are fundamentally interdependent, or inter-expressive. This means that Einstein's absolutization of the relative scope in his relativity theories violates the Univocity Framework, which actually explains why it is fundamentally incomprehensible and irrational, as we will see.

[ii] This, already, is an obvious violation of the principle of dependent arising.

absolutize the mode—giving it the boundless properties of the absolute scope with respect to time, i.e. the property of timelessness, or eternity—is to absolutize the relativity of boundary and the form of personal identity; to confuse the worlds of Emptiness and form, Substance and mode.

> [Leibniz] further infers…that the number of such substances is infinite for roughly the same reason that the number of points on a line is infinite [recall the labyrinth of the continuum]. No matter how small a slice of the universe you take, it will contain an infinite number of substances. … he dubs these substances with a name derived from the Greek for "unity," first used by his predecessor Giordano Bruno… monads.
>
> … As substances … monads must be entirely self-contained. That is, they depend on nothing else to be what they are. The most important implication of this is that they cannot interact with one another in any way at all—for, if they did so, one monad could conceivably alter the nature of another monad, and this would imply that its nature depends on the activity of some other substance, which, by definition of substance, is not permissible. Thus, monads are—in Leibniz's notably poetic language—"windowless." They can't see out, and you can't see in.

Stewart goes on a bit later…

> One of the most striking and controversial inferences that Leibniz draws from the substantial nature of the monad is that a monad's future is written into its essence from the very beginning of things. He expresses this daring doctrine in terms of logic as well as metaphysics. The "complete" concept of a substance, he says, must contain all the predicates that ever have been and ever will be true of it.

Instead of windows, Leibniz says, eternal monads flash into existence complete with "mirrors" that can show them, in some aspect, the entire universe and their place in it, all *somehow* without any real conduit to the outside, since they can't have any windows or external dependencies. It makes one wonder how a monad could act on such causeless information without it "changing his nature." This monad-mirror, gives Leibniz's system a strange version of infinite depth of complexity, like a hologram or the Hindu concept of "Indra's net,"[i] but at the expense of dependent arising necessary for a nondual view of relative modalities, such as boundaries and, it would seem, monads. Stewart says:

[i] Indra's Net: "Hinduism and Buddhism give life to the idea of Indra's Net. In the heaven of Indra, a vast net or web of silken strands spans across space infinitely in every direction. Every intersection of gossamer thread hosts a shining luminous pearl or multifaceted jewel. The surface of every jewel completely reflects every other, and the net as a whole. Likewise, each reflected jewel in itself reflects every other, that reflects every other, that reflects every other, without end, as mirrors to infinity. Indra's Net may alternately be known as 'Indra's Pearls,' or the 'Jewel Net of Indra.'" (from answers.com)

> By means of these "mirrors" of consciousness, each monad replicates the entire universe of monads within itself; and so each monad is a "universe in prototype."

Leibniz is here trying to have it both ways in order to make room for the independence of personal immortality in opposition to the radical rationality and modernity of his own inherent Spinozism. Indeed, Leibniz's entire philosophy, as Stewart shows, can be seen as a reaction against the modernity of Spinozism, and the absolute category of the monad is the cornerstone of this reaction. Leibniz wants *independent* monads—an infinity of substances—who can see outside without the causal *inter*-dependencies (interface of dependent arising) necessary for perception. This is clearly an absurd result of his reactionary metaphysical postulates of monad/selves as isolated/eternal substances. These monad-substances are numerical or absolute distinctions, and given our rules of the absolute in the Univocity Framework, an absolute distinction, difference or polarity, cannot stretch vertically into the relative; a mono-pole is "forbidden" to mono-polize the absolute scope at the expense of its identical-opposite. And, recall, such an absolute polarity can only therefore be a tautology, otherwise it is a contradiction in terms, a conflation of prefused scope, and a violation of univocity and Nondual Rationalism. Stewart continues (my ***emphasis***):

> Leibniz refers to this strange vision of worlds within worlds as "the principle of the microcosm and macrocosm"—meaning that the microcosm contains or replicates the macrocosm all the way down to the infinitely small. He expresses the same notion in his claim that the ancient doctrine that ***"All is One" must now be supplemented with the equally important corollary that "One is All."***

This is truly a fascinating idea, and one that we will explore and *make sense of* in great depth.[i]* But according to the identity of opposites and the nature of the horizontal polarity at the absolute scope, the absolute plural and the absolute singular must be identical; ALL can only and always equal its identical-opposite ONE, it cannot equal "one" monad *in relation to* the infinitely *many* other individual monads which it can see in its magic Indra's mirror. Polarity at the absolute scope is tautological. The absolute, by definition, cannot be split into a symbiogenetic and purely relative polarity, but only an absolute identity and tautology; e.g. ONE = ALL.

This may be easier to understand in terms of the principle of univocity; (absolute) unity (or Identity) has one voice and can only express (relative) difference. Since the unity (absolute scope) can only express difference (relativity), then difference at the scope of unity is not real difference, but merely identity. A polarity at the absolute level of identity can only be a dual

[i]* See, The (Binary) Cycle of Unity, p254.

way of seeing/saying the same identical "thing," because this "thing" (the absolute level) enfolds and unfolds all things, concepts, their opposites and polarities and cannot be encapsulated by any of them.

The polarity of the ancient "All is One" is, and always was, horizontal and absolute; an identity and ultimately a tautology, however useful it is as such. With his monad as the boundary between "macrocosm and microcosm" (the solidus in I/T and in the vision-logic equation ∞/∞), Leibniz has tacitly shifted (equivocated) from the absolute scope of unbounded or Infinite Unity,[i] to the relative scope of the monad, the mode or finite unity.[ii] It is only, and exactly, half true that the monad contains *within* itself the All of Infinite Difference. The other half of the All that the monadic interface *exactly* bisects is *the infinite without*, or the transcendent pole of the immanent/transcendent uni-axis which the monadic interface conceptually spans.[iii]

The original "ALL is ONE" is, therefore, *already and necessarily* an absolute identity (in mathematical terms, an "equality") and thus "ONE is ALL" is already the same statement as "ALL is ONE." In other words, if ALL = ONE then it follows necessarily, and indeed trivially, that ONE = ALL, just as it follows from 2+2=4 that 4=2+2. But it doesn't follow, necessarily (or at all), that "*one* = ALL." An identity necessarily goes both ways and none, because, ultimately, they are the same "thing." The line in the equation and its arbitrary direction are an artifact of the linearity of symbolic thought, not of the identity itself.

But given that Leibniz is talking about his monad, and hence the relative scope of the "one," not the "ONE," this trivial identity and reversed tautology of ALL=ONE is clearly not the sense in which he means "All is One" in his principle of macrocosm and microcosm. The con-fusion is cleverly hidden in the conflation of the undifferentiated, pre-fused and undisclosed scope parameters of the term "ONE," which provides for the undetected point of ambiguity upon which this equivocation turns to the "one". In Leibniz's tacit shift from absolute to relative scope in his principle of macrocosm and microcosm—from the ONE to the one—the finite unity of the monad, the "one" is taken as the illogical, or otherwise tautological, numerical (absolute) distinction between the "one" and the "ALL," forcing the independent (tautological) attribute of the absolute on the monad rendering it necessarily "windowless," and merely self-identical. We will see, however, that indeed,

[i] And the scope of the 1st order Absolute Infinity. See the section on The Triune Infinite: Interfacing Emptiness (p268), and also the section on Infinite Unity: ALL is ONE, p240.

[ii] … the level of the 3rd order infinite, or bounded infinite

[iii] Leibniz's corollary in the "principle of macrocosm and microcosm" *is* true, however, in the sense that the *interface* could not exist without the infinity within and the infinity without, the I/T axis of the ONE is ALL. The within/without and the triuning/tuning-in interface (the I/T and its solidus divider) are also polar opposites.

in the sense that the monadic interface (and *real* difference) is composed of an infinite depth of detail, it does indeed rest in the absolute of the ONE, and refract into the ONE-ALL through the Cycle of Unity (p255).

Leibniz equivocates either unknowingly and/or simply to justify the principle of the macrocosm and microcosm with a twist on an ancient truism. And all of this complex verbal wizardry—with its smoke-and-mirrors sleight-of-hand scope-equivocation and con-fusion—in turn is to justify the absolutized immanent mono-pole of the monad, eternal and independent (absolute scope), yet whose beginning in time is dependent (relative scope) on the choice of a providential transcendent God who could not *really* have chosen other than this "best of all possible worlds." And thus, to conserve this univocity violation, God must create each eternal and independent monad in a flash of transcendent-bias and a puff of scope con-fusion, each with a magic mirror that can see Indra's Net without causing a change or a perception in the unobserving observer.

PART TWO: INTERFACE MATHEMATICS

MATHEMATICS: THE ART AND SCIENCE OF PURE RELATION

> *It is impossible to understand human beings well if one does not realize that mathematics germinates from the same root as poetry, that is, from the gift of the imagination.* — M.C. Escher[i¥]

Despite the wild success of mathematics in its pragmatic roles in science and technology, mankind has long been plagued with paradox and confusion when it comes to infinity and number and the relation of mathematics to physical and mental reality. Typical discussions about these mathematical issues, in both specialist and vernacular tongues, hide a tangled mess of oxymorons, equivocations and deeply rooted ideological conflicts. These confusions (and indeed con-fusions[ii*]) hide behind seemingly innocuous common phrases such as "infinitely small," or "infinitely many," as well as more formal and rigorous philosophical/mathematical problems such as the paradoxes of the infinite; the philosophical and commonsense problems with the *limit* and the *infinitesimal* of the calculus; and the controversy and confusion surrounding Cantor's notion of the *transfinite* in modern set theory.

The bulk of these problems, it will be shown, arise ultimately from misunderstandings and con-fusions about the fundamentally polar, nondual and univocal relationship between infinity and number (the finite)—which, as we have seen and will see in much greater detail below, are the quantitative aspects of the absolute and relative scopes, respectively.[iii*] This

[i¥] From "To Believe and to Think", qtd. in *Escher on Escher* p.150)

[ii*] A con-fusion is a *con*flation of a pre*fused* distinction. See Con-Fusions at the Interface, p122.

[iii*] see Phase TWO: Polarity and the Opposable Thumb of the Mind, p112.

con-fusion in turn arises from errors in the common meta-mathematical and philosophical paradigm, an aborted, distorted and pre-mature rationalism, through which (among other things) we conceptualize and understand mathematical operations.

This current mode of under-developed mathematical understanding (meta-mathematics) is characterized by an extreme level of abstraction, i.e. a paucity of percept in its abstract concepts. This is due to the academically-common disabling separation of concept from percept—the causal, visual, and hence visceral, connection to the imagination and intuition, and our evolved cognitive interface with reality. This percept-anemia results in a lack of conceptual coherence and explanatory power in mathematics, easily accounting for the difficulty of learning and hence the fear, and even dread, which mathematics is notoriously capable of invoking in students. Problems in thinking, teaching and learning arise because the deeper percept-based distinctions underlying mathematical thought remain fused at the pre-rational level with its transcendent-bias and dominance of representational forces, i.e. concepts abstracted from their originating percepts.

We will find that the utilization and expansion of our Vision-Logic Coordinate System (VCS) and Univocity Framework, for understanding the basic elements of mathematics, such as number and infinity, as well as for distinguishing between the different operational polarities (axes) tacitly underlying the various operations in mathematics, readily resolves these paradoxes and confusions. It grounds the mind in an experiential model for deeper understanding. This deeper understanding then provides for a powerful resonance between mathematics and nondual-rational, or trans-rational, philosophy, an integration seen more explicitly in the work of Leibniz, for example (and Spinoza as well, to the extent that he was a mathematician).

We will add to the VCS and Univocity Framework, much greater clarity and understanding through making a distinction between the different kinds or degrees of infinity, as first hinted at by Spinoza and later adopted by Leibniz, and adding the "VCS meta-tags" and "vision-logic equations," to help us quickly keep track of these deeper-level distinctions and to reason about them simply and symbolically, as well as perceptually. Elucidating these distinctions between aspects that were previously fused and conflated (and hence con-fused) in common thinking, renders discussions about infinity in all its various forms much more specific and clear, and therefore much easier to understand and communicate. This revitalized and fleshed-out distinction dissolves the common paradoxes and confusions rather effortlessly when understood and applied properly.

Given this new foundation in the Vision-Logic Coordinate System, the whole thing (metaphysics, mathematics, physics, epistemology) fits together in a much greater harmony in the conceptual mind. With this model, mathematics has been rendered into its holonic and truly rational and

nondual form which exactly matches the form of modern "trans-foundational" holonic notions of reality, such as Ken Wilber's "Integral post-metaphysics,"[i] as well as the emerging fractal cosmologies of Rob Oldershaw et al, and the emerging holonic paradigms of fundamental physics.[ii]

Through the re-integration of concept with percept at the vision-logic level of cognition—with the help of the Vision-Logic Coordinate System (VCS), the patterns, tools and operations used in one domain become naturally transferable to the others because all conceptual domains are enacted in their deeper, self-similar, holonic percept-based forms. Consequently, the principles, VL-axes and basic concepts at the meta-level of the VCS and the more abstract and general level of meta-mathematics and even mathematics itself, sets up a harmonious self-similar resonance echoing among all these knowledge domains, integrating the differentiations into a more evolved whole; making an *organism* out of a mere collection—a holon out of a heap.

The problems with mathematical thinking, however, extend far beyond the percept-impoverished common meta-mathematics and lead directly to metaphysical or epistemological errors with the relation of number (an epistemic or *representational* holon or "meme") to reality (the ontic-level of a sub-representational or *real* distinction, or unity, such as an atom or apple). Since the whole of the philosophies and sciences is a transcend-and-include holarchy, these deeper metaphysical and epistemological problems (which extend beyond mathematics) have contributed to the unfortunate abandonment of causation in modern physics and its 21st century trajectory into highly abstract (blind-logic) and convoluted mathematics, such as the "higher-dimensionality" (what I call black-box metaphysics) found in String Theory, which lacks any causal and experiential method for understanding its arcane and highly *inelegant* mathematics. We will explore this in great depth in *SpinbitZ: Volume II*.

Modern meta-mathematics and hence mathematical physics are "non-modelable" and in effect, pre-rational. They do not function in harmony with the perceptual foundations of the human mind, and hence cannot be modeled effectively in the imagination—and, as a subset of self-similar reality, the mind should naturally be able to echo itself into a reflexive understanding of its own unified or nondual substrate as dependently arising in both external (objective) and internal (subjective) reality. The limits and functions of standard mathematics are abstracted, simplified and generalized far away from those of causation and physical reality, so if

[i] minus its shadow element of academic misinterpretations and aborted rationality and the performative contradictions forced therefrom.

[ii] … such as Steven Rado's *Aethro-Kinematics* and, most importantly, Gerald Lebau's *Sorce Theory*

mathematics is to replace causation in our models, then special care must be taken to define and account for those differences, enabling us to retain a reasonable calibration (Fuller's "modelability") between number and objective, causal reality, and between arithmetic and geometry.

Mathematics, as understood herein, is the art and science of pure relation, or the representational artifice and interface of the abstract realm of form in univocal polarity with Emptiness (e.g. the polarity of Infinity and number).[i] In the embryogenesis of the concept, from generality to specificity, mathematics operates at the very root of relation, or as Henri Poincaré puts it, "the harmony within." As we will see, this *harmony within* of pure relation is abstracted from percept into recursive layers of concept; an unfolding, complexifying differentiating-and-integrating, holarchical embryogenesis of symbolic operation which has lost track of its perceptual and imaginative origins.

Mathematics is merely a tool for abstracting and interfacing the quantitative/multiplicative aspects of the finite and infinite at the most abstract and general level of relation. This depth of generality in the embryogenesis of the concept gives mathematics its power and extreme applicability for modeling relation in virtually all fields of conceptual, exploratory or empirical endeavor. This power from generality, however, is the very reason that mathematics can so easily be abused. There is so much raw resonance with reality-based complexity evident in this art and science of pure relation that it is very difficult to draw the line between reality itself and the novel worlds intrinsic to the medium itself. This difficulty naturally makes it easy to confuse the two and fall into the essentialism of mathematical Platonism.

Mathematics transcends-and-includes the pre-mathematical. It brings with its own emergence new forms not previously existing and not mirroring anything else. As an emergent, it possesses its own nature, apart from its mirroring or mimetic properties. Indeed mathematics seems to be a more general, rarefied and rigorous laboratory for the study of conceptualization itself, so its study maps directly to the study of semantics, in the immanent direction, and to philosophy in the transcendent, as we will see. So the study of math, from a vision-logic point of view, provides a kind of general embryogenetic map of conceptual thinking which helps to avoid conflations and confusions, such as paradoxes, in all sorts of fields. Math, being the art and science of pure relation, seems to provide a simple or distilled example of thinking, in general. All the paradoxes of math and

[i] And in this designation, we are making no fundamental distinction between logic and mathematics. Mathematics may be a form of logic or logic a form of mathematics, it is not clear, and perhaps, at this level, meaningless.

philosophy, for example, are rendered moot when the proper (nondual) meta-context is available.

This view of mathematics as the art and science of pure relation, however, does not rule out the mathematical *aspects* or "essence" intrinsic to reality or relation itself drawn out by neo-/Pythagoreans and Platonists. Quite the contrary. Reality can at once be both *mathematical* and *other than (or beyond) mathematics* as the art and science of relation. It is real relation itself, in this interface of mathematics with reality, that endows mathematics with its power of modeling relation. This is, in effect, a power of self-similarity between reality and its real echoes into its representational interfaces, and the same self-similarity is at work in the interface between knowledge itself (episteme) and reality (the ontic) interpenetrating and harmonizing throughout Nondual Rationalism, as a whole.

Starting from R. Buckminster Fuller's integrated percept-concept notion of "a return to modelability" and "Operational Mathematics," a simple topological or visual analysis of infinity and number as a polarity and triune interface of the unbounded and the bounded (Emptiness and form), presents a natural and intuitive solution for understanding the fundamental difference and inter-expressive relation between mathematics, number, mathematical operations and the various forms of the infinite. This system grounds mathematics in the visual, holarchical and conceptual categories, distinctions and limitations necessary to unify mathematics with nondual and integrative ontology and epistemology. Once understood, this visual model renders the commonly hidden errors of mathematical thinking glaringly obvious and rather elementary—like trying to put a square peg into a round hole. This is the value of visual-visceral thinking; it uses the evolved and powerful transcended-and-included sensorial capacities of the human mind in visualization to aid in self-similar correlation and reflection between the abstractions of mathematics the mind and physical reality. This simple visual and conceptual grounding solves the many common mathematical paradoxes through the development of a clear, distinct and integrated perceptual and conceptual context.

PRE-RATIONAL CON-FUSION AND THE PARADOXES OF THE INFINITE

As far as the laws of mathematics refer to reality, they are not certain, and as far as they are certain, they do not refer to reality. — Albert Einstein

Implicit Holonic Set-Theory and the Part-Whole Axiom

Dare to be naïve. — Buckminster Fuller

In the perceptual foundations of the mind operates a hidden logic of sets. This logic is encoded in the very process of development. It is the logic of the relation of the parts to the whole. We encounter this part-whole relation as an infant onwards, inescapably in the interaction with the parts and wholes of our relative world. We see it, feel it, hear it, and even smell it and taste it, whenever something falls to the earth and breaks apart, or when we pull something apart into its constituents, or put something together making a larger whole.

When you take apart an orange, for example, you can see, feel and smell that you have broken beneath the aromatic boundary of rind and are now operating at the collective level of wedges. When you break through the skin-boundary of those wedges, pulling them apart, you can again easily sense that you are now operating at a different and even deeper level; the realm of those squirting little sacks of juice. One wouldn't imagine, in this natural percept-concept mode of thinking, that a little sack of juice is equal in size, quantity of taste, or magnitude to an entire orange full of them. Similarly, it is senseless to think that an innermost Russian doll is the same size as the outermost, or the inner core of an onion equal in circumference to the outer skin, or that it contains as many onion shells within it.

A set, in this "implicit holonic set theory," is a collection of parts taken at a higher level, as a whole, a boundary. A holonic set is a bounded-collection,

a whole made of parts, and parts that make a whole; a whole-part or a part-whole, or simply a holon.[i] A good example would be a collection of marbles, taken at a higher level in a sack. At a still higher level we can take another collection of many sacks of marbles in a still larger sack. And any sack of sacks of marbles will still be part of a larger environment, such as the child's bedroom where the game of marbles is played. There is no set that is not a subset of a larger set; no whole that is not a part of a larger whole. And in the set-holarchy, it is naturally unthinkable that one of our marbles can be equal in size to the whole sack of marbles which contains it, or that a sack at the first level has the same number of marbles as a sack of sacks of marbles at the second level surrounding it, or that a single marble is equivalent in size to a room in which a game is played with them.

We naturally, implicitly and "unthinkingly" are programmed by evolution to keep track of the immanent or transcendent (emergent) levels in the holarchy of bounded-collections as we break them down into parts or build them up into wholes. This natural, intuitive or implicit logic—founded upon the human perception of sets as bounded collections[ii]—is encoded, if abstractly and incompletely, in the "part-whole axiom" of classical mathematics which states simply that "every set is greater than its proper subset." Everything we experience in the relative world of form is bounded, in some sense, and made of deeper collections. These "implicit sets" are, in essence, boundaries around deeper collections, themselves boundaries around still-deeper collections—potentially, logically, and very possibly, *ad infinitum*. It is only when the self-identity of abstract categories comes into play that these natural faculties have no ground or traction in difference and begin to slip, leading to paradox.

In the implicit holonic logic of sets, for example, it makes little *sense* to have a collection of nothings, or an "empty collection." The more sensible way to phrase it would be that we have no collection at all; a non-collection. This brings us to a question, indeed an equivocation—a juicy semantic ambiguity buried under a mountain of dry concepts and categories, hidden at the very core of the controversies of modern (axiomatic) set theory. *Is a set a* ***collection*** *or a* ***container****?* If it is a collection, or a "collection of objects,"[iii] as it is commonly claimed, then the "empty set" (as I will show in

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[i] Note 1: The use of 'holon' in a theory of sets, is necessarily more abstract and general than a holon in the typical use, such as that by Ken Wilber. Abstracted out of the typical equation is the necessity of the notion of emergence, since we are dealing with holarchies of mere "classes" or abstract categories. When using implicit holonic set theory to refer to real-world holarchies, emergence must again be factored in. Note 2: We could also call this holon the "anatom" in that it is the antithesis of the atom. The anatomic corpuscle in not indivisible, but infinitely divisible. It has an anatomy.

[ii] …and this, in turn is part of a holarchy, as we have seen in the section, Vision-logic Interfaces: Vision-logic and Blind-logic, p124…

[iii] From Wikipedia: Axiomatic set theory: The basic concepts of set theory are set and membership. A set is thought of as *any collection of objects*, called the members (or elements) of the set.

more depth below) is inconceivable, unimaginable and illogical, and merely implies the *absence* of a set; a non-set. If a set is a container, on the other hand, which is needed to make *sense* of the non-collection of the empty-set, denoted, for example, by the notation {}, then an infinite set—such as that used extensively by Cantor and modern axiomatic set theory—is infinitely illogical and inconceivable, because a container cannot *sensibly* be "infinite in size"; a boundary, by definition, cannot be boundless. An infinite container, then, would likewise be a ***non***-container.

In axiomatic set theory, this *naïve* question brought on by the rigorous application of the imagination is considered moot. Along with it, the percepts that originally formed the basis of our notions of set-relations have been buried under a mass of conceptual abstraction. At this level sets are no longer conceived by means of the sensorial imagination as either boundaries or collections, or even more sensibly as bounded-collections, but, in actuality, only abstractly and technically as *categories*, or "classes." As the Stanford Encyclopedia of Philosophy states (my ***emphasis***), "The language of set theory is based on a single fundamental ***relation***, called MEMBERSHIP." The more modern and rigorous definition of a set is that it is "determined by its elements."[i¥] This new definition is at once more verbally precise and yet more semantically general or ambiguous. Indeed, it is this generality of classes which provides its power and high degree of applicability. But one must always be wary of what is lost in this kind of transition up or down the EOTC, and in this case, as we will see, what was lost led to a critical paradox. This paradox in turn, forced the transition from "naïve" to "axiomatic" set theory, which effectively, though incompletely, reinstated the previous restrictions of the holonic logic of sets implicit in the human mind, but in purely "axiomatic" or syntactic machinations, leaving the perceptually embodied human mind in the dark.

What is the cost of this transition from the implicit, specific and empirically-derived holonic notion of sets to the explicit general notion of sets as classes with relations of membership? What is lost in the divorce of concept from percept in the modern purely categorical notion of sets? As we have seen, this abstraction of classes—now freed from the perceptual clues and restrictions of implicit holonic set theory—allows a tacit equivocation of sets as collections *and* as boundaries or containers, while blurring the distinctions and relations of both. In effect, the axiomatic and categorical modern notion of a set has been stripped of its immanent/transcendent holarchical information and rendered purely in terms of a transitive-plane of self-identity. All sets as categories are now conceived in freedom from natural holarchy, causing a *naïve* disruption of the connections of percept

[i¥] Stanford Encyclopedia of Philosophy: Set Theory; < http://plato.stanford.edu/entries/set-theory/ >

taken for granted and forgotten in the movement into concept. These lost connections in naïve set theory are the bonds symbolically or axiomatically replaced in the newer axiomatic versions of set theory, and, as we will see, in the study of mereology, literally the logic or study of parts.

In the naïve, abstracted freedom of the categorical set, breaking from the holarchical, immanent/transcendent percept-aspect of sets as containers, allows for the "infinite set," such as the universal set—or the *boundless* category of ALL categories (note the absolute scope). Unlike any holonic or real-world set, the universal set appears to be a member of itself, i.e. it's own subset. The universal category of all categories, is itself a category, and so, it would seem—according to these abstract rules of class and membership—it is a sub-category of itself. (This, we can quickly see, leads to an infinite regress of self-recursion, akin to the "grandfather paradox" in similarly abstract musings on time-travel.)

Likewise, equivocating in abstraction in the other direction, away from the explicit definition of a set as a "collection of objects," or subsets, allows the implicit holonic aspect of a set as a whole, a boundary or a *container*, to re-emerge. This equivocation, in turn, allows the undisclosed set-as-container to contain a *collection of nothing*, providing us with the useful, but problematic, empty-set. Without this implicit equivocation from sets as collections to sets as containers the empty-set would be meaningless—a non-set—just as in the other direction we get the non-container of the infinite set (boundless boundary). Yet at the same time, this equivocation to sets-as-containers *explicitly* denies Cantor's special use of the unbounded or infinite set in his transfinite orders due to the absurdities of the "infinite container."

An empty collection is simply not a collection at all. It is a non-collection; a non-set. Even in terms of the common definition of a set as a "collection of objects," the empty set is explicitly not a set. There is no "collection of objects" in the empty set. And in the more abstract notion of sets as defined by the "fundamental relation" of sets and membership—"a set is determined by its elements"—there are no elements in an empty set, and there can be no relation between a set and its non-existing elements. It clearly takes a tacit equivocation in the definition of a set (as a collection, not a container) to reach the empty container of the empty-set—the non-relation between a class and its missing members—and this is easily achieved in axiomatic set theory when concept (and reason) is freed from the causal/empirical restraints of percept, our interface with reality, implicit in the holonic logic of sets.

This equivocation can be seen clearly in attempts to *make sense* of the empty-set. The article in Wikipedia on the "empty set" states (my ***emphasis***): "The empty set is not the same thing as *nothing*; it is a set with nothing *inside* it, and a set is *something*. This often causes difficulty among those who first encounter it. ***It may be helpful to think of a set as a bag***

containing its elements; an empty bag may be empty, but the bag itself certainly exists."[i¥] Recall the definition of a set as "***a collection of objects***." We now have a ***new*** definition of a set as a "bag" or container *for*, not *of* objects, or even *just* an empty container. Both of these aspects of sets were abstracted from the implicit holonic logic of sets, but when taken separately, and indeed equivocated between, they allow sets that have lost their immanent/transcendent aspects and "violate" the Univocity Framework, reaching into the absolute scope. This, in turn, causes the well-known problems with both the universal and the empty set.

The universal and the empty set each form two identical-opposite non-holonic, and absolute-scope aspects of modern set theory. The universal set is the aspect of *absolute* unbounded affirmation—allowing the "collection of objects" to be conceived, non-holonically, as its own sub-collection. And the empty-set is the non-holonic aspect of absolute unbounded negation, allowing the tacit definition of sets as containers to be filled with the non-collection of emptiness. The empty set, unlike the universal set, explicitly *cannot* be a member of itself, because then it would no longer be empty. It would be filled with an empty, abstract, infinite recursion of its self-negating self, similar to the universal set.[ii]

Neither the universal set nor the null set, are "proper" sets, in the implicit holonic logic of sets because they break from the implicit logic of sets as bounded-collections, or part-wholes; they break from the relative world of form into the absolute realm of the formless. They possess the absolute and unbounded aspects of affirmation and negation, respectively. A set, in this empirical/sensorial holonic logic, is *necessarily* a relativity; a part-whole, collection-container, set/member relation. A holonic set is a relation with other holonic sets, but critically *within* in an infinite, unbounded holarchy: a critical univocal polarity of polarity, between the absolute and relative scope of the infinite and finite; the boundless and bounded; the holarchy and the holon. A set is the relative, bounded aspect of the univocal polarity. The universal set breaks from the container aspect of the holonic set, which in turn is needed to sustain the notion of the empty-set in its tacit breaking from the explicit definition of the set as a collection. They each break in the opposite direction from relative-scope, holonic percept-concept of the bounded-collection—the whole made of parts, of the implicit holonic set theory—to the absolute scope of the formless and unbounded.

So, what happens when we mix the two non-holonic, absolutized aspects of the universal and null sets? Suppose that we can form a set of ALL sets, a universal set of sets that, like the empty set, are *not* included in themselves.

[i¥] Wikipedia: Empty-Set; <http://en.wikipedia.org/wiki/Empty_set>

[ii] The empty set is the set-theory equivalent of the "omni-non" which we will explore a bit later.

In the freedom afforded by abstraction into the universal set-aspect of absolute affirmation, we then ask ourselves whether *this* class is contained in itself. This "set of all sets that *do not* contain themselves as a member" *does* fit its own class-membership description, and therefore it enters into the abstract member-relation and becomes a subset of itself. But if it now *does* contain itself as a member, then suddenly it does not fit its own abstract properties and hence it *does not* belong in its own set. And if it now does not belong in its own set, then it does, and back and forth *ad infinitum*. So, from either assumption, the opposite follows. This antinomy is commonly called "Russell's paradox," after its discoverer, Bertrand Russell.

The paradoxes of logic and mathematics arise only when we "violate" the Univocity Framework—breaking from the relative scope, *unwittingly* monopolizing the unbounded absolute with the relative concepts of sets, and deviating through abstraction from the natural holonic set-logic with its inherently delineated, perceived and conceived holarchical levels (immanent/transcendent relations) of bounded-collections. Russell discovered his paradox in the abstract set-theory of Frege (now called "naive set-theory"), and it occurred precisely because of the naïve abandonment of percept-restrictions leading to the ambiguity in the classical system of classes. This conceptual abstraction—freed from its own holarchical foundation of perception and imagination—failed to keep track of the holonic levels in the implicit percept-logic of sets. This "violation" and equivocation in turn, as we just noted, allowed both the universal and the empty set to exist, coexist and interact, with "disastrous," or perhaps *revealing*, results.

Russell was deeply troubled by this paradox he found in Frege's work, as it impacted his own work, and interestingly, his own solution to the paradox was based on applying a hierarchy or holarchy aspect in his theory of "types," in order to keep track of the different levels of set membership. Even Frege himself had an implicit holarchical solution to the problem as it occurred in his theory of properties; he avoided it by a distinction between *levels* of concepts in which a concept can never take itself as argument. The implicit holonic logic of sets naturally precludes this self-recursion, or self-confusion, along with the problematic universal and empty sets, or otherwise makes their "paradoxical" properties naturally explicit and accountable, delineating these as special cases and not "proper" sets.

Indeed, as the study of mereology has found, the move from *naïve* classical set theory to modern *axiomatic* and "Zermelo-Fraenkel" set theory is essentially a move to reinstall—in abstract, explicit mechanisms—the logic needed to keep track of the levels of sets and to restrict these violations of the sensorial holonic logic already implicit, yet buried under abstraction, in the stratified human mind. It is not generally recognized, however, that the part-whole relation, itself derided as naïve, was the correct logic all

along, and the move into axiomatic set theory was a move to reinstall the truths of this naiveté in the sense-barren abstraction of the set as category. The incorrect naiveté , it is clear from an outsider's retrospect, is the naiveté of the categorical set *conceived purely transitively*, without its immanent/transcendent holonic aspects.

The goal throughout the rest of this unfolding of Interface Mathematics is not to *replace* modern axiomatic set theory, in any of its variations, but merely to *inform* it with an implicit, intuitive percept-logic of sets; to reconnect the concepts back with the percepts from which they were abstracted into far more general and hence useful symbolic mechanisms. The end result will be to know the place from which we started more thoroughly, having re-examined and reconnected our roots in perception.

The Galilean Part/Whole Paradox

The modern notion of the infinite, in axiomatic set theory, has its roots in the paradox discovered by Galileo. In the *Two New Sciences*, Galileo laid bare an apparent contradiction in the property of "infinite sets," such as the whole numbers (0, 1, 2, 3, …). Galileo noted that the whole numbers seemingly contain the much smaller subset of the "perfect squares"[i] (0, 1, 4, 9, 36, 49, 64, 81, 100 …) with the spaces between the squares growing rapidly, filled with non-square whole-numbers, such as the many non-square whole numbers between 81 and 100, for example. Both the perfect squares and the whole numbers are infinite in extent, yet the number of whole numbers, seems to be vastly larger than the number of squares, with the gaps between squares growing ever larger. Yet, given that the squares are derived by a multiplication of *each and every* whole number with itself (a "one-to-one correspondence"), there are then, of necessity, exactly as many perfect squares as whole numbers.

The set of whole numbers and its subset of squares are then apparently equal in size, and this is clearly a violation of the part-whole axiom, which states that a subset must be smaller than its set. It is this paradox which essentially led to the abandonment of the part-whole relation implicit in the holonic logic of sets, and which, we will find, led to Cantor's notion of the transfinite orders of infinity as well as modern axiomatic set theory.

Or as Spinoza puts the problem, so much more simply, "If an infinite quantity is measured by parts equal to a foot, it will consist of an infinitely many such parts, as it will also if it is measured by parts equal to an inch.

[i] … or we could just as accurately say the "perfect triangles," as we will see…

And therefore one infinite number will be twelve times greater than another."[iv]

From Galileo's *Two New Sciences*:

> *Salviati: This is one of the difficulties which arise when we attempt, with our finite minds, to discuss the infinite, assigning to it those properties which we give to the finite and limited; but this I think is wrong, for we cannot speak of infinite quantities as being the one greater or less than or equal to another. To prove this I have in mind an argument which, for the sake of clearness, I shall put in the form of questions to Simplicio who raised this difficulty.*
>
> *I take it for granted that you know which of the numbers are squares and which are not.*
>
> *Simplicio: I am quite aware that a squared number is one which results from the multiplication of another number by itself; this 4, 9, etc., are squared numbers which come from multiplying 2, 3, etc., by themselves.*
>
> *Salviati: Very well; and you also know that just as the products are called squares so the factors are called sides or roots; while on the other hand those numbers which do not consist of two equal factors are not squares. Therefore if I assert that all numbers, including both squares and non-squares, are more than the squares alone, I shall speak the truth, shall I not?*
>
> *Simplicio: Most certainly.*
>
> *Salviati: If I should ask further how many squares there are one might reply truly that there are as many as the corresponding number of roots, since every square has its own root and every root its own square, while no square has more than one root and no root more than one square.*
>
> *Simplicio: Precisely so.*
>
> *Salviati: But if I inquire how many roots there are, it cannot be denied that there are as many as the numbers because every number is the root of some square. This being granted, we must say that there are as many squares as there are numbers because they are just as numerous as their roots, and all the numbers are roots. Yet at the outset we said that there are many more numbers than squares, since the larger portion of them are not squares. Not only so, but the proportionate number of squares diminishes as we pass to larger numbers, Thus up to 100 we have 10 squares, that is, the squares constitute 1/10 part of all the*

[iv] Ethics, Part I, Prop XV, Note.

> *numbers; up to 10000, we find only 1/100 part to be squares; and up to a million only 1/1000 part; on the other hand in an infinite number, if one could conceive of such a thing, he would be forced to admit that there are as many squares as there are numbers taken all together.*
>
> *Sagredo: What then must one conclude under these circumstances?*
>
> *Salviati: So far as I see we can only infer that the totality of all numbers is infinite, that the number of squares is infinite, and that the number of their roots is infinite; neither is the number of squares less than the totality of all the numbers, nor the latter greater than the former; and finally the attributes "equal," "greater," and "less," are not applicable to infinite, but only to finite, quantities. When therefore Simplicio introduces several lines of different lengths and asks me how it is possible that the longer ones do not contain more points than the shorter, I answer him that one line does not contain more or less or just as many points as another, but that each line contains an infinite number.*

As we have seen in the implicit holonic logic of sets, the "infinite set"—such as both the set of whole numbers and the set of perfect squares—though perfectly adequate as abstract, general classes are not proper holonic sets because they are boundless, not bounded, collections. They are merely the abstracted "collection aspect" of implicit-holonic sets, conveniently neglecting and equivocating from the container aspect of sets needed to make *sense* of the empty set.

We will come to see "infinite sets" more clearly as "set aspects," or "aspect infinities," rather than bounded-collections with *definitive* numbers of elements, magnitudes or "cardinalities." This new way of looking at things will illuminate and resolve the truth behind this paradox in accord with Galileo's own reasoning that aspects of the finite, such as relative magnitudes, do not really and fully apply to The Infinite. We will do so, however, without nullifying Cantor's great achievements in the operationalization of the quantitative aspects of infinite sets, but only with added clarification as to what is really taking place in these operations, thus dissolving the controversies surrounding the Cantorian transfinite and the modern axiomatic theory of sets.

For the time being, however, we have the tools in hand to see a simple resolution of the Galilean paradox as a function of scope con-fusion in the Univocity Framework. As we have seen, the quantitative aspect of the relative scope is the finite. It deals with the bounded and with all relations, such as the hierarchical or holarchical relations of one magnitude to another. The absolute scope, on the other hand, has the quantitative aspect of the

infinite and unbounded. It is therefore unable to deal with relation having no boundaries "between things" with which to relate.

An infinite set, therefore, reaches into the absolute scope, drawing out the quantitative aspect of the absolute in the unbounded and infinite. It therefore possesses the quality of the absolute scope in its ultimate inability to relate, one with another. In other words, an infinite set is not a relative set, but a "finitized" and relativized *aspect* of the absolute scope. This is why two infinite sets, such as the squares and wholes—as Galileo intuited and Cantor effectively confirmed, as we will see—cannot properly be compared as to their "number of elements," and indeed, they actually have no number of elements, but simply the numberless quantitative aspect of the infinite. Infinite sets can relate one with another, and to finite sets only univocally, as multiple aspects or voices of the one absolute; The Infinite.

Hilbert's Paradox of the Grand Hotel

The German mathematician David Hilbert presented us with another paradox which can help illumine the problematic pre-rational view of infinity still in action in modern mathematical reasoning, or meta-mathematics.

From the Wikipedia entry on Hilbert's paradox, we find:

> In a hotel with a finite number of rooms, it is clear that once it is full, no more guests can be accommodated. Now, imagine a hotel with an infinite number of rooms. One might assume that the same problem will arise when all the rooms are occupied. However, in an infinite hotel, the situations "every room is occupied" and "no more guests can be accommodated" do not turn out to be equivalent. There is a way to solve the problem: if you move the guest occupying room 1 to room 2, the guest occupying room 2 to room 3, etc., you can fit the newcomer into room 1. Unlike a finite hotel, in an *infinite* hotel, being "full" in the sense that every room contains a person is not the same as being "full" in the sense that there is no space for another person. Note that a movement of an infinite number of guests would constitute a supertask.
>
> It would seem to be possible to make place for an *infinite* (countable) number of new clients: just move the person occupying room 1 to room 2, occupying room 2 to room 4, occupying room 3 to room 6, etc., and all the odd-numbered new rooms will be free for the new guests. However, this is where the paradox lies. Even in the previous statement, if an infinite number of people fill the odd numbered rooms, then what amount is added to the infinite that was already there? Can one double an infinite? Also, for example, say the infinite number of new guests do come and fill all of the odd numbered rooms, and then the infinite number of guests in the even rooms leave. An infinite has just been subtracted from a still

existing infinite, yet an infinite still exists. This is where Hilbert's Hotel is paradoxical.

In the Galilean paradox we saw that infinity, taken as a quantity, does not function properly with respect to mathematical operations, such as squaring. In this paradox we can see more clearly that infinity does not fit the function of a quantity with respect to such properties as addition subtraction, or division; for example, in division by two to get the evens and odds. In a sense, we can actually see this paradox as a more vividly visual example of the Galilean paradox. Imagine, for example, that we extend the paradox by only filling the rooms with labels matching a perfect square. The "number" of perfect squares are indeed infinite, yet the hotel would seem almost entirely empty after this infinitely time-consuming procedure, this "super-task," of filling the perfect-square numbered rooms.

If we think of this in terms of the one-to-one correspondence used by Galileo, we can see that by shifting the occupants down by one room, we are effectively merely shifting the numbers on the rooms by one unit, and hence shifting the one-to-one correspondence of the room-numbers and occupants without really changing the nature of the hotel and its infinite, or unbounded capacity at all. When we allow the occupants to fill up the odd numbered rooms, we are merely acknowledging, as Galileo did, that the odd numbers are by themselves infinite, in that they have a one-to-one correspondence with the Natural numbers and the evens, just as do the perfect squares.

THE NONDUAL-RATIONAL AND EMPIRICAL EMBRYOGENESIS OF MATHEMATICS

EMPIRICAL/EXPERIENTIAL BEGINNINGS: BUCKY'S "OPERATIONAL MATHEMATICS"

Great strides toward a nondual rational-empirical, or trans-rational, meta-view of mathematics were made by Buckminster Fuller (Bucky) in his exquisitely beautiful *Synergetic Geometry* with his steadfast emphasis on starting from experience, rather than the purely rationally-derived Euclidean "elements" such as extensionless points and lines of zero-width. Amy C. Edmonson, in her book *A Fuller Explanation*, relates a vivid example from Bucky's childhood:

> The teacher stood at the blackboard, made a little dot, and said, "This is a point; it doesn't exist." ("So she wiped that out.") Then she drew a whole string of them and called it a "line." Having no thickness, it couldn't exist either. Next she made a raft out of these lines and came up with a "plane." "I'm sorry to say it didn't exist either," sighs Bucky. She then stacked them together and got a "cube," and suddenly that existed. Telling the story, Bucky scratches his head as if still puzzled seventy years later: "I couldn't believe it; how did she get existence out of nonexistence to the fourth power? So I asked, 'How old is it'? She said, 'don't be naughty.' ... It was an absolute ghost cube." (6-9).

Bucky's seemingly innocent child-hood reflection conveys a profound realization, one made by Spinoza around 300 years earlier. It is likely that this intuition is made by certain "naïve" children all over the world, before it is programmed out them. There is no existence—relative or absolute—without the aspect or "attribute" of (volumetric) extension.[i] Once the forms of our modern abstract mathematics reach three-dimensional, and volumetric extension, then suddenly they become *sensible* and can be imagined as existing (and aging) in the real world. Bucky's incredulity at the sudden existence of "nonexistence to the fourth power" conveys his intuition of this powerful rational principle.

Rather than build existence from extensionless "nonexistence to the fourth power" Bucky's "Operational Mathematics,"[ii] deals exclusively with what can be modeled *volumetrically*, *visually* and *viscerally*. (These can be

[i] The absolute, recall, enfolds all aspects and attributes, including extension.

[ii] In standard mathematics, the term "Operational Mathematics" refers to Laplacian and other integral transforms.

taken, rather playfully, as the 3Vs of modelability.)[i] So because an extensionless point could never be seen, touched, tasted, heard, smelled or otherwise even *imagined* in percept-form by anyone (it can't be modeled in "3V"[ii] at any conceivable scale) then it cannot exist *within* Operational Mathematics, as an item to be *operated upon* or as an element to construct anything with, not even a coordinate system. Likewise, since an infinite line and plane do not have volumetric extension, and cannot be modeled visually or viscerally then they too cannot exist in Operational Mathematics and the objectively-real world.[iii]

This injunction to deal exclusively with the *a priori* sensible and hence volumetric (and truly rational) is what Fuller calls "a return to modelability"[iv¥] because it returns mathematics from syntactic abstraction to a semantic grounding in the realm of the senses, the visualizable, conceptual, imaginable, modelable and ultimately empirical and causal, *in principle*. These extensionless concepts—such as "infinitely small," or "zero-dimensional" points—do play a part in the understanding of nondual-rational, or trans-rational, mathematics (as we will see), but they are not to be found *within* mathematical operations as items to be operated *upon*, because without being extensive, bounded bodies or magnitudes they cannot interact, inter-relate or be operated upon and hence they cannot be symbolized as numbers or magnitudes with de-finite magnitudes.

Again, these are aspects of the infinite, and hence function according to the rules of the absolute scope in the univocal relations of the Univocity Framework. The Infinite quality abstracted into the aspects can't properly relate amongst themselves, except through their finitized qualities, such as the various methods of set-generating "countability," as we will see.[v*]

A Note on "Operational"

The term "operational," such as in "operationalize," is used extensively herein. In general it refers to a syntactic and explicit level of functionality, rather than to Bucky's "Operational Mathematics." Interface Mathematics is,

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[i] This, however, is not to say that everything in the objectively-real world is tangible, such as energy, and subtle forms beyond empirical reality, etc, but merely that it is embodiable in the imagination and also that modelability can *translate* quantitative and *objective* ("IT" quadrant) aspects as such, when the appropriate scales and empirical adjustments or hypotheses are taken into account.

[ii] Note, 3V can also stand for the **V**ision-logic version of 3D: 3-vision-logic-dimensionality….but let us avoid the natural tendency to call that 3VD. ;-)

[iii] You may think of visualizations of infinite planes or points in a computer program, for instance, but these representations are always measured in terms of pixels and truncated infinities, i.e. discrete units. There is no possible representation of an infinitely thin anything and this is because the concept amalgam is an oxymoron.

[iv¥] Synergetics 216.03

[v*] See, To Infinity and Beyond: Tuning and Triuning the Paradox, p432.

however, generally "Operational" in Bucky's sense of the term, but it is not properly Operational Mathematics because it does not replace modern dimensioning systems or geometry with Bucky's Operational and Synergetic Geometry. Rather it renders visible the hidden operationality, or modelability, already enfolded in the embryogenesis of the system of mathematics itself. Bucky's Operational Mathematics, and his experiences and intuitions merely help us see more clearly what we are after in this work; namely the more general "return to modelability" or the reconnection of concept with percept, as already delineated by Arnheim.[i]* When referring to the visual, visceral and volumetric aspects of Interface Mathematics we will use the term *modelable*, rather than operational, or otherwise make it apparent by capitalizing it as a proper noun, e.g. Operational Mathematics.

Unfortunately, we must forego a fascinating excursion into much of Fuller's Synergetic Geometry in which many irrational numbers are unnecessary and in which all geometrical dimensioning ends in whole number multiples and relations using four spatial dimensions in order to modelably account for our four-dimensional constants in physics. The standard XYZ coordinate system ends at three perpendicular dimensions, so a whole class of constants is currently beyond the reach of modelability and thus ultimately impossible to understand. Yet four-dimensionality is absolutely necessary to quantitatively account for empirical reality. Therefore the scientists, having come in through the "attic window," as Bucky says, are missing the essential tool of modelability and understanding (semantics) because they are using a dimensioning system (syntax) that does not intrinsically fit reality. But, rather than delving into Synergetic Geometry, at this point, instead with our new "Operational" background we will pick up the trail where we left off-the distinction between infinity (apeiron) and number.

[i]* See, Vision-logic Interfaces: Vision-logic and Blind-logic, p124.

THE POLARITY OF THE FINITE AND INFINITE

The Finite, The Infinite, and Scope

We have already encountered the polarity of the finite and infinite in the context of scope and univocity. It is also the more general aspect of the polarity of infinity and number, which gives us the implicit identity of the infinite number. The finite and infinite are the polar aspects of boundedness and unboundedness for the relative and absolute scopes, respectively. And in terms of pure-relation, they are the quantitative aspects of our polarity of scope—the polarity and "contra-diction" at the very foundation of quantitative reasoning itself, because our primitive notions of number correspond precisely to boundary, as we will see.

The relative scope—and mathematics itself—necessarily deals fundamentally in boundedness because in order for two event-objects to inter-relate or even exist, they must have limits and boundaries (whether gradients or not), excluding or including (or otherwise relating to) the other.[i] By definition, however, the absolute scope cannot deal in boundaries, and this is precisely because boundaries inter-*relate*—at the very least (and fundamentally) between the inside and outside of that boundary. Indeed, boundaries actually *are*, in a sense, this inter-relation or triune interface between the within and without. It is in this sense that boundary necessitates its own transcension in the boundless beyond and within itself. The one cannot exist without the other.

The absolute scope, then, deals in the generally ineffable aspects of unity and infinity, and the relative scope deals in the polarities and multiplicities of the finite.

The Identity vs. the Opposite: Post-Modern Con-fusion and Pre-modern Naiveté

In esoteric wisdom we have the polarity of the infinite and the finite (or bounded number) as a simple identity of opposites. The problem is that this

[i] An interrelation involving an event/object with itself is an identity, and no real relation at all. Hence an identity is, in some sense, a function of the absolute scope. The bounded identity functions as an interface between the relative and absolute scopes because it identifies the infinite in the finite or bounded individual. Such a bounded identity, as we have seen in the section on the Univocity Framework, is a horizontal tautology, and if it is unbounded then it is vertical.

identity of opposites was not properly fleshed out, and through the LCD of exoteric representational forces, the pre-modern esoteric polarity became flattened into a mere *duality* of opposites: "infinity is not a number." … but why, and in what sense is infinity not a number? What about Cantor's "infinite numbers"? What about the immanent infinities of the "irrational numbers"? Neither the exoteric classical duality, nor the esoteric ancient polarity can satisfactorily explain these questions to the exacting standards of modern, post-classical mathematics *and* philosophical logic and reason. And Cantor's transfinite arithmetic only touches them as they intersect the field of mathematics, leaving in its wake a sprawling mess of philosophical loose ends, as terms radically and unintuitively shift in meaning into their seeming opposites. A mess for philosophers, to be sure, but it can be entirely ignored by mathematicians uninterested in the controversies and meanings of their machinations.

Against this classical duality of opposition between the finite and infinite, the modern mathematical notions seemed to focus exclusively on the missing *identity*, as it was parsed through the *similarity* of the abstracted set as category. This is what Deleuze sees as the problem with a set-theory based ontology. It sees everything in the terms of a similarity of the concept, namely the abstract set. It reduces everything to a pure or abstract "belonging" to the mathematical or pure-relational category. As Alain Badiou writes, "[Deleuze] is challenging a set-theory ontology of elements and belonging … which weaves out of the vacuum the greatest complexities, and *reduces to pure belonging* the most entangled topologies."

One of the problems with this set-theory ontology is that it generates "a constant ambivalence between the 'belonging' (of an element) and the 'inclusion' (of a subset)." In other words, the abstracted categorical set had lost the meaning and complexity implicit in our holonic logic of sets. And we have seen these ambivalences and entangled topologies at the very onset of this set-category, with its categorical blindness to the implicit holonic logic as it manifested in Russell's paradox, for example, but it also shows up in the many paradoxes of set theory not discussed in this volume. And again, it was only with the abstract, axiomatic re-encoding of the lost truths of the part-whole (holonic) axiom that the paradoxes were brought into mathematical reign. This is seen for example, in the fact that axiomatic set theory has now come into line with mereology and its explicit part-whole axiom, which set-theory explicitly or exoterically denies. There is, then, an ambivalence of set-theory to this part-whole axiom, which on its face is denied, but in its hidden and blind abstract inner-workings, it has necessarily come to resemble.

Deleuze counters the mathematical notion of the set with the notion of the "fold," which he extracts from the Leibnizian monadology. We will find, however, that the fold is essentially our Spinozan aspect infinite, as it

abstracts the immanent infinity of the aspect of locality from the infinite ONE-ALL. Badiou says, quoting Deleuze's *The Fold*:

> Leibniz-Deleuze's thesis is that the point, or element, cannot have the value of a unit of matter: "The unit of matter, the smallest element of the labyrinth, is the fold, not the point" (p9).

In this, Deleuze is directly in line with Spinoza and Leibniz, but also in line with Whitehead's "point-free geometry," and our Interface Mathematics.[i]* It is the point, conceived as Euclidean element, which generates the labyrinth of the continuum, recall, and it was only with Leibniz's abandonment of the point for the Spinozan aspect infinite (Leibniz's "termini"), as we will see,[ii]* through which he found his Ariadne's thread. Badiou continues [my **emphasis**]:

> Leibniz-Deleuze's ontology apprehends the multiple as a *point-subset*, that is, as an extension (an unfold) or a contraction (a fold), with neither atom nor vacuum. **...there have never been but two schemes, or paradigms, of the Multiple: the mathematic and the organicist**, Plato or Aristotle. Opposing the fold to the set, or Leibniz to Descartes, reanimates the organicist scheme. Deleuze-Leibniz does not omit remarking that it must be separated from the mathematic scheme: "in Mathematics, it is individuation which constitutes a specification; this is not so with physical things or organic bodies" (p87).
>
> The animal or the number? This is the cross of metaphysics, and the greatness of Deleuze-Leibniz, metaphysician of the divergent world of modernity, is to choose without hesitation for the animal. After all, "it is not only animal psychology, but animal monadology which is essential to Leibniz's system" (p146).
>
> The real question underlying this is that of singularity: where and how does the singular meet up with the concept? What is the paradigm of such an encounter?

We'll see this encounter explicitly as it unfolds into the embryogenesis of mathematics,[iii]* and as it traces its way through evolutionary unfolding into the crossroads of the ontic/epistemic and subject/object, in Interface Epistemology.[iv]* The encounter takes place through the interface of Spinoza's Triune Infinite, as well as explicitly on our Vision-Logic Coordinate System through the interface of the immanent/transcendent uni-axis, in conjunction with the omni-axis through the Cycle of Unity. But again, this is getting ahead of our story. Badiou continues [my comments].

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[i]* See, Boundary and Dimension: (p295), and The Holarchical Unfolding of Number and Operation (p306).

[ii]* See, Spinoza's Triune Infinite, p270, and Reconnecting the Lost Thread of Mathematical Rationalism: Spinoza, Leibniz, Immanence and the Calculus, p400.

[iii]* See, The Holarchical Unfolding of Number and Operation, p306.

[iv]*See, Interface Epistemology: A Preliminary Sketch, p541.

> If Deleuze likes the Stoics, Leibniz, or Whitehead, and if he does not much like Plato, Descartes, or Hegel, it is because, in the first series, the principle of individuation [e.g. infinite difference beyond belonging to the pure similarity or opposition of the concept] occupies a strategic place, which it is denied in the second. The "Leibnizian revolution" is greeted with rare stylistic enthusiasm in Deleuze's supple narration, as the "wedding of concept and singularity" (p91).

In the shock and integrating interface between the pre-modern *opposite* and the post-modern *identity*, then, we will see emerging again—but as a cultivated third and triune interface—the ancient nondual *identity of opposites* of the finite and infinite. It is this identity of opposites that finds its germination in the lost truths of modernity, namely in esoteric rationalism as we find it in Spinoza's Triune Infinite, also reflected and refracted through Leibniz's reactionary monadology. And in this integration will likewise continue to unfold this "wedding of concept and singularity." We have already seen it with the immanent/transcendent omni- and uni-axes, and we'll soon see it more explicitly in the concept of Spinoza's Triune Infinite and, perhaps at its climax, in the Interface resolution to Zeno's paradoxes.

The common, pre-modern, "naïve" mathematical and philosophical definition of the *finite* is simply: "bounded or limited in magnitude or spatial or temporal extent."[i¥] Spinoza, however, gave a more precise definition in his *Ethics*: "A thing is called finite after its kind, when it can be limited by another thing of the same nature; for instance, a body is called finite because we always conceive another greater body." Spinoza, then would be saying that there is something finite about each of Cantor's infinite numbers or transfinite sets, precisely because each one can be *surpassed* by another of its kind. This, then, gives us a glimpse of the triune interface which is to come; a sneak peak of just how inextricably interrelated is this polarity between infinity and bounded-number.

Therefore, as should perhaps be expected, the modern mathematical definition of the finite, is a bit more convoluted and abstract, as it has been replaced by notions from modern axiomatic set-theory, purely in the terms of the similarity and belonging to its bare-bones categorical identities; i.e. sets. The following definition is from Wikipedia [my comments and **emphases**]:

> In mathematics, a set is called **finite** if and only if there is a bijection [one to one correspondence] between the set and some set of the form {1, 2, ..., *n*} [it is in a one-to-one correspondence with a default finite set]... It is a theorem that **a set is finite if and only if there exists no bijection between the set and any of its proper subsets.**

[i¥] ...from onelook.com

So the modern definition of a finite set is essentially that it is equal to (bijection) the default finite set of Natural numbers—*naturally*, the finite equals the finite. But the second half of the definition states that the finite is *not equal* (no bijection) to any of its proper subsets—i.e., it doesn't violate the part-whole axiom. Notice that it doesn't mention boundaries at all, or even limitations. Thus, in mathematics, we have Kuhn-lost entirely the earlier commonsensical notion of the finite simply as bounded, limited or surpassable by another body or set of like kind. Note also that this definition is almost a straight-forward recapitulation and negation of Galileo's paradox of the infinite. It states essentially that the finite (unlike the infinite, as we have seen) does not violate the part-whole holarchical relation.

In this sense the pre-modern opposite reflects into the modern identity, as the finite is defined first in the *sameness* to the default finite set, and then in *opposition* to the sameness or identity of set and subset in the paradox of the infinite. What we have here is an *opposition* purely in terms of an *identity*, but *without* the triune integration into an *identity of opposites*. We will see the meaning and importance of this very soon.

Similarly the esoteric, or "naïve" definition of infinity (both philosophical and mathematical), from ancient times up to the late 19th century, was rather simple and straightforward, and entirely non-paradoxical, of itself. Infinity was simply *the opposite* of the finite. It was *the unbounded*, the *apeiron*, absolutely all-encompassing and beyond all conceivable, inconceivable and possible boundaries, magnitudes or numbers. It merely *lacked* any boundary or limit. Such a simple pair of opposites is not too difficult to understand, in itself. The finite is bounded and the infinite is unbounded.

The Infinite as the antithesis to the finite, was also the antithesis to implicit primitive notions of number as boundary. And because boundary, or the finite, was the implicit pure-relational concept of number, we had the simple classical dichotomy and duality between infinity and number, which remains to this day, hiding in the background, waiting to confuse us again about Cantor's "infinite numbers." This classical opposition itself, is the boundary that Cantor would soon come crashing through with his Galilean identity of the infinite number. But it had already been ruptured, and was still bleeding, from the time of Pythagoras and the immanent infinite numbers of the "irrationals." But again we're jumping ahead in our story…

Though the esoteric-naïve definition of infinity was simple and clear, its exoteric relation to other concepts—namely "number" and the finite—has been much more problematic, leading to all sorts of paradoxes, some of which we've already seen. This is not because, as we'll see,[i]* the naïve

[i]* See, The Triune Infinite: Interfacing Emptiness, p268.

definition was wrong, per se, but rather because it was *incomplete*, or prematurely aborted along with the project of rationalism itself. It was thus still conceived as a simple duality or dichotomy—an opposition without the identity in the triune interface which would be capable of unfolding the complicated and inextricable relations between its two poles—the infinite and finite. The nondual-rational or transrational concept of the Triune Infinite—this triune interface between the finite and infinite—had yet to be differentiated-and-integrated into modern meta-/mathematics, but this is indeed a function of this work.

Mathematician Dr. Reviel Netz, in a recent NOVA interview, explains this move from classical to modern conceptions of infinity, demonstrating clearly that the esoteric understanding of the key rationalists, Spinoza and Leibniz, is nowhere to be found in modern meta-mathematics [my emphasis]:

> Infinity became a really clear and well-defined *quantity* mathematically in the late 19th century, which it wasn't before and which makes it rather different from what we ordinarily talk about when we talk about infinity, namely, about something *very, very big*.

This popularization of the premodern definitions of infinity as "something *very, very big*" points to the common (exoteric) pervasive error of thinking of the Infinite in the merely *identical* terms of the finite or the set—and thus of thinking of the absolute in identical terms of the relative. This we can see is a subtle inversion of the pre-modern conceptions of infinity and bounded number as merely a duality of *opposites*, and it occurred with the acceptance of the Galilean paradox right into the heart of the modern definitions of the finite and infinite.

In ancient and modern esoteric thought, recall, infinity was not just a "*very, very big*" version of the finite. It was never really just a huge, gargantuan or cosmic "something" at all, but rather merely the boundless *apeiron—the opposite,* or simple *absence* of limit and size—which can be understood to exist at all sizes and thus none (omni-non). (It is important to note, however, that "infinite sets" are not to be taken as The Infinite or the absolute, as we will see, but merely as mathematical *aspects* or abstractions of the absolute scope of The Infinite.)

To deal with these pervasive common problems and paradoxes of the Infinite, the definition of infinity has changed dramatically. In order for infinity to become mathematically tractable, and the paradoxes to be "resolved" or rendered moot, it had to be conceived in the terms of the *identity* of the category emerging in the new theories of sets. Infinity was then radically redefined away from the terms of *opposition* and into the terms of *identity* with the finite set, largely through Cantor's vastly influential (and still controversial) expansions of set-theory into the "transfinite."

Netz continues:

> ...the defining property of infinity today is that a set's cardinality [its number of elements] is equal to the cardinality of some real subset of that set.

Netz simplifies this new set-theory definition of infinity as "Something which is equal [or identical] to some of its parts." As we should entirely expect, this definition is naturally the inverse of the modern definition of the finite. But recall that the conundrum of the Galilean part-whole paradox was exactly this; that the parts of infinity—such as the set of all squares—are necessarily infinite as well, and hence the parts are equal or identical to the whole. Recall also, that this is the unique quality of the universal set, that it violates the part-whole holonic relation and becomes a paradoxical subset of itself.

The new definition of the infinite, like that of the finite, is essentially a *codification*, *incorporation* and *encapsulation* of the Galilean part-whole paradox, rather than its resolution. We have rightly *accepted* the paradoxical nature of the infinite, in its identity to the finite, but in simultaneously discarding its opposition we have yet to *understand* its nature. We have *yet* to tune and triune the paradox into a truly nondual *identity of opposites*, and thus into a triune interface of inter-expression.[i]*

This part-whole violation is merely the result of representational forces, of thinking of the Infinite in the identical terms of the finite, i.e. in terms of parts and wholes, and more importantly, sets and subsets and their abstracted categorical relations of class membership or belonging. The modern definition of the finite and infinite—still a con-fused dichotomy, not a polarity—is a result of looking through the representational prism of axiomatic set-theory and its identical abstract categories. What do we get when we conceive of the "infinite set" in terms of the identity of its subsets? The "violation" of the part-whole axiom in the Galilean paradox where a part, or subset, is *identical* to the whole infinite set. The main difference now, is that we aren't calling it a violation or a paradox. The paradox has not been *solved* by this definition, but has now simply *become* the definition, subsumed under the identity of the concept or category of the set.

The new definition of infinity is both sensible and senseless. It is sensible to *assume*, and *operate as if*, The Infinite as a part-whole violation is implicitly non-paradoxical (even if we still have not explicitly solved the paradox). But—unacknowledged by the identity of the category—it is precisely *because* size, magnitude and number are identically opposite to infinity, that the infinite set and its infinite subsets are identical and of "equal size." According to classical wisdom this is simply because they *have* no size. And in this simplistic way, the Galilean paradox was long since rendered moot by

[i]* See, To Infinity and Beyond: Tuning and Triuning the Paradox, p432.

Galileo himself when he said that magnitude did not apply. Indeed, Galileo glimpsed this identity of opposites when he discovered that the infinite set of the integers and its infinite subsets (such as the perfect squares) can be put in a one-to-one correspondence with each other, thus further demonstrating their equality. However, Cantor later found that this correspondence with the Natural set of our counting numbers—a correspondence which Cantor would *naturally* label "countability"[i]—was not true for all types or sets of infinity, as we will see. And it is this feature with which Cantor would later assign magnitude to what he discovered as an infinite set of different "magnitudes" of mathematical infinity.

A Foot in the Door to Paradise: Cantor's Quick Fix

It is said that Cantor emancipated mathematics from its traditional bondage to number, releasing it into the domain or "paradise of the infinite," from which, Hilbert hoped, we would never be driven. In the traditional dualistic sense that "infinity is not a number," this is undeniably the case. Indeed we will see that Cantor effectively defied Kant's decree that human reason has surpassed its bounds when thinking about the infinite, as we find in his "antinomies of pure reason." Indeed, the human mind *can* reason about and, we will see, *understand* the infinite, but this understanding simply hasn't made its way into philosophy yet (though this is indeed a value of the present work).[ii]* To be sure, Cantor showed that not only can we reason about infinity (at least mathematically), but we can construct an arithmetic for interrelating its various forms and abstractions. And, as we will see through Spinoza's Triune differentiation in Interface Philosophy, the human mind can *understand* the infinite in its own terms, in the function of the imagination as it transmutes, abstracts and opens through reason itself, into the aperspectival level of vision-logic.

Cantor (with the help of Cauchy, Dedekind and many others) famously (and some would say *infamously*) "solved" the paradoxes of the infinite largely through his concept of *denumerability* or *countability*, and the operationalization of the modern mathematical continuum. Essentially, Cantor (following Dedekind) circumvented the classical notion of a set as necessarily relative and finite—a number as boundary—and hence as adhering to the holonic part-whole axiom.

Infinite sets, as we have seen, are now defined by the paradoxical feature that they are equal to their subsets, they are "self-nesting"—as Dedekind and Charles Peirce termed it—while finite sets are merely "nesting," or holarchical. This shift, from the sensible and simple notion of infinity as the

[i] No pun intended…though allowed…

[ii]* See, Paradoxical Postscript and Epitaph: Kan't and the Antinomies of Pure Reason, p479.

opposite of the bounded finite, to the unimaginable, un-sensible identity between set and subset in the paradoxical violation of the part-whole axiom, resides at the heart of the meta-mathematical or philosophical controversy surrounding Cantor's solution to the paradoxes of the infinite.

Cantor said the infinite set of Natural numbers is "denumerable," or "countable" (e.g. 1, 2, 3, 4, ... ∞) and any set that can be put into a one-to-one correspondence with it, has the same "power," "cardinality" or "number of elements," namely "aleph null." And aleph null it turns out, is only the first of the Cantorian orders of the "transfinite," in the sense, perhaps, that they *transcend* the traditional mathematical notion of the infinite *as* merely equivalent to *the set of Natural numbers* and its one-to-one correspondents.

The Natural numbers are now called "countable" even though such an "infinite set," it would seem, can never really be fully *counted*—because n+1 can never be infinite in value. This "countability" should never *reach* the infinite itself, even in principle, because with the rejection of the naïve principle, there is no final "infinitieth" value whatsoever. Each term of the set is "countable" (and indeed finite), *wherever it is found*, yes, but the set itself "as a whole," according to common-sense, literally is "*uncountable"* because there is no final term to be reached.

Countable infinity, then, can only be understood *outside* of this set-generating, time-based procedure operating unconsciously and stepwise in the imagination. It can only be understood *outside of time* in the abstraction and idealization that mathematics and vision-logic affords us. When we make such a move, however, we can again only *understand* it as boundless. The countable infinite, then, must be conceived as an *a priori* existing infinity of *already counted* or generated numerals.

This is one of the many semantic controversies and difficulties surrounding the Cantorian fix; that an infinite set (namely the lowest order) is "uncountable" and "innumerable" because it has no infinitieth term to be counted, yet Cantor is now *calling it* countable simply because of the stepwise nature of the generation of its boundless set definition. This simple, trivial, sensible and yet sense-less semantic confusion is indeed typical of the controversies surrounding Cantor's fix, and it is our goal herein to help clear up exactly what is happening behind the confusing terminology, while retaining and magnifying the extraordinary value of the Cantorian solution in the context of the nondual identity of opposites, polarity and triune interface of the infinite and finite.

Essentially, what we will find more explicitly is that the Natural numbers themselves are defined in a stepwise function of counting, and thus as a product of counting itself—if only in pure mathematical principle outside of time. The set of Natural numbers is then intrinsically countable, or perhaps better, already counted (and perhaps if necessary, only by God).

Cantor then invented some useful tricks (e.g. diagonalization) to demonstrate that all the subsets and meta-sets that would fall under the

problematic paradoxes (e.g. Galileo's perfect squares and Zeno's infinitely divisible rationals (or so it would seem)[i]) can be placed in a one-to-one correspondence with the Natural numbers and hence all of them have the same cardinality and countable status, *aleph null*.[ii]

The Cantorian Turn to Immanence: From the Uni- to Omni-Axis

So, what is a cardinality in a sequential set such as the Natural numbers if not that final number—the "infinitieth" ordinal which is absent and impossible to define for infinite sets? This, after-all, is the essence of the rejection of the naïve principle which is central to Cantor's insight, as well as to those of Leibniz, as we will see. When dealing with infinite sets, Cantor had to redefine cardinality as well, away from the naïve principle which would imply that the cardinality of an infinite set would be the "infinitieth term." And this is another key to the controversies surrounding Cantor; the creation and redefinition of all of these common terms under the identity of the categorical set.

To understand the countability of the infinite set of Natural numbers, recall, it must be imagined as one—outside of time—already counted and created. Infinite sets, then—sharing the identity of having no boundaries and no outsides—must be compared and contrasted by their *intrinsic* differences. They must be compared by their internal structure and depth and thus ultimately through their methods of generation. **This, we can see, is a Cantorian turn to immanence, as all infinite sets share the same absolute and incomparable transcendent boundlessness.**

Cantor, as opposed to the I/T uni-axis and singular immanent infinities (singularities) of the irrational numbers, turns to the omni-axis to differentiate the "powers" between the infinite sets. To make this immanent or intrinsic comparison between infinite sets, Cantor seized upon the Galilean application of the one-to-one correspondence as showing that—seemingly contrary to Galileo—magnitude and quantity do indeed apply to the intrinsic properties of infinite sets, but these Galilean sets and subsets *are actually* of the same size. This notion that a cardinality can be applied to

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[i] It will indeed be shown that Zeno's infinite division procedure was not stepwise, not of the order of the rationals and thus not merely countable, but uncountable. See, To Infinity and Beyond: Tuning and Triuning the Paradox, 432, and the subsection, Back to Zeno, p448.

[ii] As we will see, however, Karin Verelst demonstrates in great detail that the fundamental structure for all of Zeno's paradoxes is an a priori *uncountable* continuum, thus taking the form of Cantor's Continuum Hypothesis itself in the form of a polarity which, as Interface Mathematics will demonstrate, merely appears to us as a paradox given the implicit status of the fundamental binary form of the VL-axes underlying conceptual relation itself. See Back to Zeno, p448.

the infinite by means of a one-to-one correspondence or "bijection" is called "Hume's Principle," after Frege's use of a quote by Hume.

This, as well, is a controversial move, on the part of Cantor, because it is by no means unequivocally demonstrated, intuitive or clear that Hume's principle is correct. In other words, simply because a one-to-one correspondence can be made to the countability of the Natural numbers, it is not given that the concept of cardinality itself, as in a number of elements, applies to the Natural numbers, let alone to any of its one-to-one correspondents.

A Final Cantorian Solution?

The question must be asked, "Does it *ultimately* solve, or make *sense* of the paradoxes of the infinite to demonstrate a one-to-one correspondence between an infinite set and its subsets and/or meta-sets, call them 'denumerable' and give them all a quantity or 'cardinality'?" What about the fact that an "infinite cardinality" or "infinite number" operates in radically different ways from a finite one? What exactly is the nature of this difference, and how can we make sense of it? For example, you can add or subtract any amount whatsoever to an "infinite number" and you will get the *same* infinite number. Just what is *numerical* about that kind of behavior? This is clearly Hilbert's Hotel paradox still in action. It hasn't been explained by a mere identity in countability, which is indeed still controversial for this very reason. We still have the same counter-intuitive, oppositional and paradoxical behavior of "infinite sets" with no real explanation of why. The opposition of pre-modern naivety is simply obscured—transcended-and-excluded—by this new mathematical definition under the identity of the set, which merely incorporates the paradox right into its make-up.

Furthermore, to many it is somewhat confusing to call the infinite and finite versions of cardinality by same name of "cardinality" or "number" when they have such radically different properties and behaviors. And it will be shown herein that the reason "infinite numbers" act so differently is that they are not really quantities at all, in the traditional sense of numbers as boundaries, but merely quantitative *aspects* or abstractions of The Infinite. (We'll get into this in much greater detail later in the section on *Spinoza's Triune Infinite* (p271), as well as in the section To Infinity and *Beyond: Tuning and Triuning the Paradox* (p432).)

The NOVA interview continues:

> *Netz: So what appears to be a quaint, paradoxical realm — the realm of infinite magnitude — is actually very practical. It's something that allows you to extend operations with numbers to any*

> *domain whatsoever. That's what happened from the 17th century onward."*
>
> *NOVA: How did Georg Cantor's set theory refine mathematicians' thinking about infinity?*
>
> *Netz: Well, the essence of the calculus is that you deal with infinitely large objects. But you never had to define infinity itself, and you never had to worry about the nature of infinity, primarily because you always dealt with the very same kind of infinity — roughly speaking, the infinity of points making up a line, the infinity of all the real numbers between, let's say, 0 and 1. That's the type of thing they were worried about in the calculus from the 17th century to the 19th century.*
>
> *But they didn't think about what infinity is, because for one thing they didn't think about what a set is. What is a set? And then what would be the difference between a finite and an infinite set? This is something that Cantor did in the late 19th century. Cantor developed the notion of a set, and the notion of an infinite set, a set that has infinitely many objects.*
>
> *Then many, many curious things turned up. We found that the paradoxical properties of infinite sets can actually be used to define them, and even more striking — and something that is slightly technical, and for this reason perhaps not something that I can show you, but you'll have to take for granted — even more curious is that the fact that you find that once you have an infinity, an infinite set, you can create another infinite set that is bigger than the infinite set you started with. You can have two infinite sets, one of them being bigger than the other. Actually, because the operation is recursive, you can take a set and create a set bigger than itself, so you can have an entire sequence of infinity. There are infinitely many infinities, stretching all the way up.*
>
> *This, of course, gave rise to a fascinating field of operating with infinite numbers, which, in fact, are richer and more interesting than finite numbers are. That's the field opened up by Cantor.*

Indeed, as we will see, the Cantorian fix represents a very important step in the progress of mathematics as a whole. Cantor has presented mathematics with valuable tools for working with infinite sets, and he has expanded the methods and degrees of "chopping up" the mathematical infinite and operating between their respective *quantitative aspects*. The issue at hand, which we will explore in the coming section on tuning and triuning the paradoxes,[i]* is precisely what this is a fix *for*, its ultimate value to

[i]* See, To Infinity and Beyond: Tuning and Triuning the Paradox, p432.

mathematics and its relation to the paradoxes of the infinite—such as Zeno's forty or so enigmas.

It is true that Cantor's transfinite paradise is mathematically coherent and that it is functional within the system of mathematics itself, but the meaning behind the operations and labels, i.e. what they actually represent, has remained obscured. Through the identity of the concept of set as category, the understanding of the opposition between infinity and bounded number has become con-fused. It has thus emerged through this abstraction into conflict with the implicit holonic logic of sets and the philosophical and common-sense notions of the Infinite, all leading to the current controversies surrounding Cantor's work. But we have seen through mereology that this identity of opposites at work in the implicit holonic logic of sets has been rebuilt in the purely abstract machinations of the extracted category. Our task is to bring it into the understanding through the use of the concept and the imagination.

One issue, as we have seen, and will continue to clarify, is that Cantor is not dealing with The Infinite absolute, in his infinite sets, but merely with its quantitative and abstract *aspects*. Furthermore, as we will see more clearly,[i] Cantor himself made the distinction that his use of infinity in mathematics speaks of a lower order of "abstract" mathematical infinity. It does not refer to what he called "Absolute Infinity," as is often assumed. So it is incorrect to assume that Cantor is even discussing, comparing and contrasting degrees of The Infinite, or even degrees of infinity itself, but more accurately, degrees or powers of the different types of *abstraction* of The Infinite via set-generation, e.g. countability; what we will come to call "set-generation aspects" or simply "set-aspects," which are themselves functions on the immanent/transcendent omni-axis. Cantor's project, then, like Zeno's, is not incorrect, but simply incomplete, being subsumed now by the identity of the category.

So now we can systematically say that the countably infinite set of Natural numbers is numerically identical to its subsets, i.e. "self-nesting," and we can give them all a single number or cardinality, and use that number to perform a kind of arithmetic between them. And through this transfinite arithmetic, recursively unfolding above us we can "see" an infinite "paradise" of ever larger and larger infinities. Indeed, not only can we see this (mathematically speaking), but we can wander through it and perhaps use it for practical purposes.

Beautiful and functional as this *mathematical* "vision" may indeed be, however, it does not give us a vision-logic *understanding* of the crucial opposition and interface between the finite and infinite which could explain

[i]* See, Cantor's Three Infinities, p268.

why an infinite set is equal to its subsets. This Cantorian liberation and exodus of mathematics beyond the bondage of number and into the holy-land of the infinite ultimately serves only the pragmatic needs of exoteric mathematics to conceive of the infinite in the identical categorical terms of sets and subsets, in order to move beyond the troubling mathematical paradoxes in the evolution of their abstract, percept-less operations. The liberation into the infinite is only partially complete, restricted as it is to mathematics and its classes of number, and not yet open to the concepts and identities of philosophy.

Recall that Galileo also demonstrated a paradoxical one-to-one correspondence between the squares and Natural numbers. This is where the paradox started, and *almost* where it is today, as far as human understanding and philosophy is concerned. The crucial factor for mathematics was in the Cantorian *acceptance* of the paradox as simply the way it must be. Mathematics merely had to believe—to have *faith* in the paradox itself, and then to *act* on this faith. And in the enfolding of this paradox into its definitions and operations, mathematics itself has become more *systematic* and unified in its abstracted rule-based interfaces with the infinite—blindly encoding, as mereology shows, the previously cast-out part-whole holonic relation itself. But there has been little progress in the *understanding* of *why* infinite sets behave so paradoxically contrary to common sense and intuition. Even though we know how to *perform* the rituals, we still do not *understand* the ways and reasons of this new mathematical God.

In short, only for mathematicians, and essentially only in the language of mathematics, has the paradox been solved. For the bulk of us still wrestling with the angel of understanding, we remain stuck in a head-lock with the same old troubling paradoxes—still con-fused by "self-nesting" violations of the implicit holonic logic of sets and the relations between the infinite and finite—as between God and man.

Thus we seek further differentiations and integrations, transcensions and inclusions. We seek new methods of sensing, intuiting, understanding and *digesting* this newly swallowed paradox, leaving its golden Gordian knot to churn out infinite vistas in the darkness of our bellies. We seek not merely to *swallow* the paradox, but to *incorporate* its hidden truth into our being. We seek to *embody* and explore the understanding with our imaginations, and hence to rid ourselves of the indigestion of this real human controversy. We seek vision-logic interfaces with which we can resolve and assimilate this hidden, encapsulated contra-diction.

In order to get there, however, we must traverse a great deal of new terrain. But when we do, we will indeed have all the functions in place to truly understand the nature of the finite-infinite polarity underlying all the paradoxes of the infinite, including the core paradox, which is properly Zeno's. We'll be able to see this polarity between infinity and bounded-

number not simply as a pair of opposites—as in the classical dichotomy—and not merely in terms of the identical relations of the distilled category—as in modern axiomatic set theory—but in the nondual terms of an identity of opposites. We'll resolve not just the *polarity*, but the *triune interface* that provides the inter-expression that gives this identity its opposition and this opposition its identity. Indeed, we'll see that this core polarity itself is none other than the triune interface between our fundamental binary VL-axes of pure-relation; the quantized, finitized, stepwise and "countable" transitive, visa-versus the *uncountable* "through and through" simultaneous "infinite division equals indivisibility" of immanence in transcendence (yin in yang).[i]*

The Pearl Principle

As we have seen, the modern definition of the infinite represents a serious divergence of mathematical reasoning, or meta-mathematics, from coherent logical, causal and experiential thought, and specifically from the implicit holonic logic of sets. This is because, rather than *solving* Galileo's paradox of the infinite, it has merely *become the definition* of the infinite. This illustrates a common problem in modern and post-modern exoteric thought, faced as it is with many paradoxes and insoluble problems brought about by the representational forces of the finite imagination interfacing with the undifferentiated Infinite (e.g. the two fundamental VL-axes of conceptual thought and its Spinozan triune interface).

It serves the interests of exoteric, pragmatic, rigorous and logical thought, to encapsulate and insulate an annoying problem or paradox into a principle, axiom or fundamental definition in order to make it tractable and operational and to forget about the problem enfolded within. But at every turn of history toward this kind of encapsulation of paradox and problem into axiom and definition, there results a controversy, simply because the human mind seeks answers on many different fronts (e.g. Wilber's AQAL quadrants). Mankind as a whole seeks not merely *abstract, mathematical* and *syntactic* answers, but also to grasp *imaginable* and *visualizable semantic* answers; answers that make *sense* to the human mind at all levels, from percept to integrated concept.

This kind of encapsulation of paradox into principle has occurred at nearly all of our "revolutions" of thought. It happened with Newton's encapsulation of the problem of the missing mechanism of gravity into a mathematical law. It happened with Einstein's encapsulation of the problematic Michelson-Morley "null-results" into his a-mechanical and acausal principle of relativity. And it happened with the problematic wave-particle paradox (violation of causality) codified directly into the axiomatic

[i]* See, To Infinity and Beyond: Tuning and Triuning the Paradox, p432.

principle of "complementarity" or "wave-particle duality." And in mathematics it happened with Dedekind/Cantor's encapsulation of the Galilean part-whole violation into the modern definition of finite and infinite sets. In all of these cases, the solution to a problem or paradox was substituted by a principle that would again allow progress to be made at the abstract, operational and quantitative level, in spite of the confusions and controversies remaining and even magnified at the semantic level of the senses and the imagination, and hence at the expense of coherent, integral understanding.

Merely accepting the paradox into the hermetically sealed axiomatic layer of tacit assumptions—with no explanation of its core polarity whatsoever—gives the common *impression* that the problem has been solved. Indeed this is essentially what is claimed with the Copenhagen Interpretation which places the blame of paradox and confusion on Nature herself, at the quantum-level. According to this interpretation, we simply *discovered* the surprising "truth" of complementarity and wave-particle duality and bear no capability nor responsibility to solve the problem any further. It's Nature's problem now. This axiomatization of problem into principle allows progress on the more pragmatic fronts to continue, while hiding the semantic problem, its con-fusion and potential solution, under layers of abstraction, creating more problems for the philosophical attempt to *understand* the problem and its potential resolution.

In the case of the quantum, nothing could be *further* from the truth, that the ultimate "ground of Truth" had been reached at the "foundational" level of the senseless and paradoxical quantum. Indeed, there is no empirical reason to think this is the case whatsoever, because you can't know a boundary until you have gone beyond it. The reason is purely practical, to cement a dogma and quell the chaos of uncertainty itself by encapsulating it into a fundamental principle. The complexity ("randomness") surprised us merely because we were operating on a hidden foundational mindset and expecting to reach the absolute ground of a-tomic (indivisible) simplicity and generality. When this was not found, the interpretations based upon it, namely classical, particle-based and categorical notions of causation, failed. This foundationalism, however, as we have seen, is a violation of nonduality and the Univocity Framework. The paradox was simply placed firmly out of reach at the level of axiomatic assumption, and taken for the ultimate truth and foundational ground of existence in the metaphysics of scientism. These "truths" are much easier to take as self-evident if they can be abstracted into a principle and incorporated into everyday operational usage. Indeed, this tendency to encapsulate an irritating *paradox* into a simple principle is so common and pervasive today, that it will serve our purposes to encapsulate this *understanding* into a principle of our own.

As an oyster encapsulates an irritation within layers upon layers of its beautiful iridescent shell, so human beings encapsulate irritating problems into intricate abstract systems of operation, with layers and layers of impressive and daunting—and certainly useful—complexity and abstraction. Indeed, it may be the case that in rigorous systems of thought, such as science and mathematics, *any* problem or paradox of sufficient importance that cannot be solved or removed will eventually become encapsulated and insulated into a principle, axiom, equation and/or fundamental definition in order to make it seamlessly tractable, pragmatically operational, invisible and untouchable by the status quo, in order that the normal functions of paradigm evolution can continue their daily grind without calling into question the troubling problems at the very foundations upon which these workers build.

Principle 6: The Pearl Principle of Axiomatic Encapsulation

The tendency to encapsulate irreconcilable paradox into principle; dilemma into dictum; enigma into equation; nonsense into nomenclature; or ambiguity into axiom—in order to reduce the irritation and stress from repeated and constant contact with the unknown.

The Pearl Principle is actually a meta-principle, because it deals with principles themselves. But this meta-principle is true for the work of many of our scientific heroes and their "revolutionary" handiwork. Newton, for instance, couldn't solve the causation of gravity so he incorporated it into an operational principle (and an equation) to effectively save us from constantly confronting the mystery; Einstein, with the help of Minkowski, Poincaré et. al. couldn't make sense of the Michelson-Morley null-results so he codified it into the Principle of Relativity—a violation of common-sense, to be sure, but it balanced the books; Bohr et al. couldn't understand the "wave-particle duality" and the fundamental complexity or "randomness" so they codified it into the principles of "complementarity" and "uncertainty" which say that the incomprehensible, "acausal" complexity and paradoxical duality of quantum theory is intrinsic to Nature herself at the quantum level, and that sub-atomic understanding is an ultimate impossibility; and Cantor and friends couldn't escape the Galilean violation of the part-whole axiom implicit in the holonic logic of sets when looking at the Infinite through the lens of Set Theory, so they changed the definition of infinity to incorporate the paradox itself *as* the definition. In so doing, Cantor *appears* (but only on

the surface) to have entirely abandoned the esoteric understanding of infinity as boundless and innumerable, calling it denumerable and bounding it with a cardinality and number for the sake of operationality.[i]*

For this encapsulation of *ambiguity into axiom*; enigma into equation; or paradox into principle, we give these intensely creative individuals the highest praise. But one can't blame us, we seek direct expansion of pragmatic power, often regardless of whether or not we *understand* that power. And we can only bang our head against a wall for so long before we seek a new direction in the labyrinth. So it is natural to praise the guy who points us away from the operational dead-end and into a new, more productive direction, even if, with respect to *understanding* (and in this case meta-mathematics), the operational advance is often necessarily backward and mostly lateral in other domains, causing, in these domains, more confusion than resolution.

[i]* Though, with his own Triune Infinite in mind—which it generally isn't to mathematicians meta-mathematicians alike—this provides Cantor with an ambiguous sort of escape route, which we'll discover soon in the sub-section on Cantor's Three Infinities, p268.

UNITY AND NONDUALITY

Nonduality can be understood in many ways, as we have seen, but the Univocity Framework—the fundamental polarity of scope and its quantitative aspects in the infinite and finite—provide a unique logical and rational clarity on the subject. From *The Lotus Sutra* we find, "The concept, often described in English as 'nondualism,' is extremely hard for the mind to grasp or visualize, since the mind engages constantly in the making of distinctions and nondualism represents the rejection or transcendence of all distinctions."(Watson) And from Bede Griffiths (1997) we find, "Advaita (nonduality) does not mean 'one' in the sense of eliminating all differences. The differences are present in the one in a mysterious way. They are not separated anymore, and yet they are there."

Nonduality is, in part, the recognition that there is no ultimate duality, i.e. ALL is "not two." As we have seen,[i]* this is, because no one part of any duality can fully contain its own essence, i.e. they are *empty* of essence and arise in *dependence* on other parts. But the mind quickly moves from "ALL is not two," to the position that, "ALL is therefore one." Nonduality says, however, "ALL is neither two nor one. It is 'the rejection or transcendence of all distinctions.'" This provides the mind with an enigmatic launching pad for a leap of intuition to understand what is meant by "all is nondual," but it doesn't explain what this leap means in explicit logical or rational terms, for to do so is to speak dualistically, because all terms are terminals of polarities.

There is a way, however, to use polar terms and distinctions to explicate what is happening in making this leap of intuition. The ancient non-dualists, in this case, were simply operating on a common, singular notion of 'unity,' rather than making the distinction between the absolute and relative scopes, and their quantitative aspects in the Infinite and finite modes of unity which we will explore below. When the non-dualist says that "all is not one," he is addressing the student where he generally resides, at the relative scope, the everyday world of form. He means effectively that, "in the way that all could be two, all is not one." In this sense, he is tacitly making the univocal distinction between the absolute and relative scopes and negating the relative move from duality to the common notion of unity which sees the "One" dualistically,[ii] as a "principle of the same" foundationally underlying

[i]* See, for example, What is Nondualism?, p56.

[ii]* See, Univocity: Monism, Polarity and the Nondual, p156.

the Many. The absolute and Infinite form of Unity, however, sees the identity of opposites of the ONE *in* the ALL; Unity as the *identical opposite* of infinite Multiplicity; Emptiness *as* form, and vice versa; not two, but not merely one.

As we have seen, duality and finite multiplicity (the Many) operate only at the relative scope, since as soon as we have differentiation we necessarily have relation. So when speaking of duality, or "two," our scope is necessarily at the relative level. In communicating the concept of the nondual, generally when we shift to the absolute univocal scope of "ALL is ONE"—the one voice that can only speak infinite difference—this necessary implicit shift in scope is not communicated. Since "two" is already finite and bounded (relative scope), then without the shift being communicated explicitly in the "nonduality is not two," the "ONE" would be taken as relative, finite and bounded as well, the "one," which is precisely the wrong meaning. This is pointed to in the following quote from T'ai Chi Chih, "'Advaita' in Sanskrit means 'Non-Duality.' This is a difficult concept for most people as we look about us and see multiple objects." The proper understanding of an Infinite Unity is not bound to distinctions, but contains and exfoliates them all.

So, with the preliminary distinction between the absolute and relative scopes, and the Infinite and finite aspects of unity, the leap of intuition from bounded and relative notions of unity in the multiplicity of everyday objects, to the Infinite and univocal "ONE is ALL" in the nondual, becomes more fully explicated and much more easily replicated or communicated at the cognitive and logical level.

Infinite Unity: ALL is ONE

As we have seen, Infinite Unity is absolute unity, and The Infinite[i] because unboundedness, or Emptiness, is the definitional essence of the absolute scope. This is necessarily the simplest, most fundamental and abstract of all meta-mathematical unities. Infinite Unity can be readily summoned with the univocal identity of opposites "ALL is ONE," a defining feature of the absolute scope. This is also Phase One in the embryogenesis of the concept.[ii] The "ALL is ONE" was the original meaning for the term "Universe" as "one song"; "a single voice raises the clamour of Being;" that which expresses ALL of reality and, of necessity, as ONE inter-expressive unity. In the ALL-ONE, there is nothing left to bound or surpass the totality of existence. ALL is ONE, in pure principle and by definition. And in accordance with implicit holonic logic of sets, nothing else can exist apart from the set which includes

[i]* first order infinity, see Spinoza's Triune Infinite, p270

[ii] Note how, at the absolute scope, and in resonance with our principle of absolute reversal, the identical opposite of ONE is automatically included in the absolute multiplicity of the ALL.

everything, i.e. The Infinite Set or the universal set-as-*boundless*-collection, as opposed to "one of many" sets and subsets as *bounded*-collections.

Taken this way, at the absolute scope, there can be no multiple infinite unities or UNI-verses, without a contradiction in terms, because the ALL, as absolute scope, includes ALL of every type and instantiation, absolutely. This is the defining feature of Buckminster Fuller's intuitive abandonment of the article "the" when referencing "Universe." There is only ONE Universe, and there is nothing other than "Universe," so no need to make the distinction between "the Universe" and anything else. Everything is Universe; ALL is the ONE song; one symphonic, cacophonic clamoring of Being expressing itself into Becoming.

Furthermore, in accordance with the principle of absolute reversal, and the omni-non, this ultimate category of the ALL is also the absolute non-category (and non-identity), because at this ineffable absolute scope it cannot function categorically to partition (polarize) one concept from any other. Infinite Unity includes ALL, period, so there can be only ONE. This simplest of ideas is easily forgotten and the words blurred into new meanings and confusions.[i]

It is easy to see here that this infinite and boundless kind of unity, at the absolute scope, does not correspond to the mathematical concept of a number, not even the primitive Natural number 1 (or 'one'), which we will see as a mathematical abstraction of the finite unity of bounded form, the relative scope. Infinite Unity, being unbounded and absolute, cannot participate in relational, and hence mathematical operations. Without boundaries, it can't relate. It is ineffable. It cannot be added to, subtracted from, divided by or multiplied, because by definition it unfolds and enfolds ALL in existence; there can be nothing to add to everything and nowhere else to subtract it to. There is nothing else to relate Infinite Unity to and no outside perspective, operation/operator or implicit hidden set, from which to withdraw or transfer any arbitrary quantities. The "ONE" is not a number, it is "inquantate," because Infinity itself, the boundless ALL, is not a definable or "boundable" magnitude.[ii]

Using what we are herein calling "vision-logic equations," we can break it down further. Vision-logic equations (VLE) use the symbols and operators of mathematics to simplify and succinctly display the relations involved at the vision-logic level of Interface Mathematics. They have slightly different

[i] Note that, just as according to Spinoza there are infinite attributes of "God" so too there are "aspects" of infinite unity abstracted as various infinities of a specific kind. These are the "aspect infinities," such as infinite space or infinite time (eternity), abstracting the spatial or temporal aspect of The Infinite, respectively. We'll discuss this in more depth in the section, Spinoza's Triune Infinite, p270.

[ii] This is even true according to Cantor's own triune categorization of kinds or degrees of infinity.

rules, which will be explained as they come up, and are used in a much looser fashion than mathematical equations. They are used more as quick, symbolic/visual metaphors, or maps, illustrating relations, rather than quantitative derivations. This is largely because of their extensive use of absolute and inquantate infinity,[i] and its inability to really partake in *quantitative* operations—operating, as the VLE often do, between the relative and absolute scopes.

As we discussed in The Univocity Framework (p153), The ONE-ALL relation is the identity of opposites and univocity of the absolute and relative scope, respectively. And as we will see, this is essentially the God/Substance relation in Spinoza, as well.

The first conceptual operation upon the Infinite Unity of the absolute ONE is the application of the identity of opposites and the principle of absolute reversal to find its inverse-identical, in the absolute immanent multiplicity. Thus we come to the *quantitative aspect* of Infinite Unity, the ALL. The absolute ONE, seen relatively and quantitatively, then, is expressed as its identical-opposite, the ALL, or The Infinite.[ii]* And in terms of Nondual Rationalism, the quantitative ALL is expressed by the VLE ratio, ∞/∞.

So breaking it down using the vision-logic equations we have the following: For our purposes the quantitative aspect of Infinite Unity (the ALL) can be expressed loosely by the VLE:

$$ONE = \frac{\infty}{\infty} \qquad \text{(VLE: Infinite Unity)}$$

The *transcendent aspect* of the ALL, the common notion of infinity within absolute Unity, is expressed as:

$$\frac{\infty}{1} = \infty \text{ [iii]} \quad \text{(VLE: Transcendent Infinity)[iv]}$$

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[i] This is not to exclude Cantor's transfinite operations, because, as we will see (See, Cantor's Three Infinities, p268), Cantor as well, in his own Triune Infinite, excluded his first order "Absolute Infinite" from his third order "mathematical infinite," which he defined as "abstract."

[ii]* This is the first order of infinity in Spinoza's Triune Infinite. See, Order 1: The Absolute Infinite, p272.

[iii] …or even inversely as $1/0 = \infty$, recalling our reciprocity across the solidus and our see-saw analogy (see The "Labyrinth of the Continuum" and the Principle of Nondual Rationalism (p71), that pushing up on one side of the see-saw gives the same result as a corresponding weight on the other.

[iv] We will come to find this as also expressing Leibniz's transcendent definition of God, as opposed to Spinoza's definition of God, not as the transcendent pole of the immanent-transcendent axis, but as

And the immanent aspect of Infinite Unity is expressed as:

$$\frac{1}{\infty} = \textit{immanent "zero"} \quad \text{(VLE: Immanent Infinity)}$$

Recall that *immanent zero* is really the boundless immanent pole of the immanent-transcendent axis, or the infinite rational zero we encountered already in The "Labyrinth of the Continuum" and the Principle of Nondual Rationalism (p73). The boundless zero of infinite division is never reached because it is "infinitely small." This can also be represented by a single, abstract and "infinitely precise" location, an ideal point or what we are calling a Euclidean implicit singularity. In this same sense, with the inversion occurring across the solidus/vinculum, placing a zero in the denominator (the immanent position of the ratio) is identical to placing infinity in the numerator (the transcendent position of the ratio).

In this interrelation between the multiple or quantitative aspects of The Infinite, i.e. the ALL, we are already necessarily in the scope of the relative in its *quantitative view* or *aspect* of the absolute which it generated in an act of self-reflection.[i]* And in the transition through the eye of the uni-axis we pass through the unit-boundary of the relative, the 'one', the uni-axial interface between the immanent and transcendent aspects of Infinite Unity. However, because Infinite Unity is not a bounded whole, and therefore does not have a magnitude, it cannot be divided operationally or mathematically and thus it cannot be *quantitatively* halved (or otherwise modified in quantity). This we have already seen abstractly and incompletely in Hilbert's paradox of the hotel. Anywhere on the immanent-transcendent axis that we place the solidus boundary of the *one*, we still have infinity on both sides, and thus—no matter what the scale of the volumetric solidus/vinculum—it is always *exactly* in the middle, yet the infinity has not been *quantitatively* decreased by half even if you discard one half for the other.

This division of Unity into polarity (e.g. ∞/∞) is therefore not properly mathematical or quantitative, but *pre*-mathematical and *pre*-quantitative or meta-paradigmatic; at the vision-logic level of meta-mathematical cognition (e.g. the VLE). It is merely a percept-integrated conceptual exfoliation of a possible intrinsic relation, or a way of conceiving the polarity between The

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the absolute view of the absolute scope, or simply a transcendent *emphasis* of the immanent-transcendent omni-axis and polarity.

[i]* See, Polarity and Univocity (p174).

Infinite and the finite unities. It is this vision-logic, nondual-rational, or trans-rational polarity within which the mind can cycle. It is also, essentially, the meta-mathematical abstract rendering of the union between God and man; the absolute, ineffable Infinite Unity and the relative, effable finite unity as the solidus-vinculum between infinite immanence and transcendence.

As we have seen with the Hilbert and Galilean paradoxes, Infinite Unity, or Infinity (as opposed to the common notion of infinity used, say, in the term "infinite set," which is merely an *aspect* of The Infinite), when operated upon—divided, multiplied, added to, subtracted from, counted by odds, evens or perfect squares into its multiple quantitative set-aspects—*always returns infinity*. This is the nature of the absolute scope that, even when conceived in its multiple aspect of the ALL, it cannot properly be operated upon without leading to paradox or tautology[i]*, such as "self-nesting" and the ONE-is-ALL, respectively. And this is the core principle reconciling the paradoxes of the infinite—an abstract generality which we will flesh out in much more detail. We can see this principle as another resonating chord in our Ariadne's Cable, from our first chord, the Principle of Nondual Rationalism; infinite division equals indivisibility.

[i]* See, The Univocity Framework (UF), p153.

Principle 7: Chord 5: The Quantitative Principle of Infinite Unity

Infinite Unity, or its unbounded aspects of infinity, when operated upon, always returns infinity.*

Explanation: Infinite Unity is the quantitative aspect of the absolute scope, therefore it cannot participate in the art and science of pure relation (mathematics) except for the role of the context and field of its other. It is "inquantate," not quantitative or measurable. In nondual terms, Infinite Unity is "not one," in opposition to "Many." This principle can be stated with a "vision-logic equation"[i] where Ω is taken as a general operator standing for *any* operation, or relation, whatsoever:

$$\frac{\infty}{\infty}\Omega n = \frac{\infty}{\infty} \quad \text{or} \quad \infty\Omega n = \infty$$

* … or zero, the omni-non, given the transitive function of zero as negation. Thus, to hold, n, in transitive functions such as multiplication, cannot equal zero.

A prime example of the failure to grasp the principle of Infinite Unity and the modelable nature of Interface Mathematics, is with the use of the "point-particle" in particle physics. Because the foundation of modern mathematical reasoning (meta-mathematics) is not fully rational—in that it does not explicitly recognize the immanent-transcendent axis or its immanent pole and its rational-zero as the immanent expression of infinity—physicists do not explicitly conceive of a mathematical point as itself representing an "infinite quantity." Because this immanent infinity (opened up through the function of the mathematical ratio) remains hidden and "undefined" under the rational-holonic solidus (by the transcendent-bias of pre-rational representational forces) the scientists were surprised to find that operations thereupon—in the form of "infinitely-small" point-particles—returned the answer of infinity when calculating its energy as a function of distance squared.[ii] This failure led to the need for the euphemistic, and now exceedingly necessary and useful, process of

[i] * See the coming section: VCS Meta-tags: Scope Parameters and Vision-logic Equations, p288.

[ii] And as we will soon see, in the holarchical unfolding of the functionality of the higher numbers and operations the rooting and powering functions come into play when the operations and their number-functions finally return again to the immanent-transcendent axis. See, The Holarchical Unfolding of Number and Operation, p306.

"renormalization"[i] where observable properties must be plugged back into the mathematical machinations to remove the infinite results from using point-particles with intrinsic mathematical singularities in transitive connection to the (implicitly holarchical and immanent-transcendent) inverse-square law.

Finite Unity: "Unity is Plural and at Minimum Two"

Finite unity, is the identical-opposite of Infinite Unity and the absolute scope. It is the unity of the relative scope. Mathematically, we will see, it is the unit-number 'one' derived as the vinculum/solidus in the polarity and cycle of Unity and the VLE ∞/∞. This is the unity of the one vs. the many, the 1 and the *n*, as opposed to the univocal tautology or identity of the ONE is ALL.

Finite unity generally corresponds to Spinoza's modifications and Leibniz's monads (and all emergents thereof). Indeed, Leibniz's principle of unity is essentially that the whole of any real unity (of which he dealt only with the finite kind) is greater than the sum of its parts. This is essentially the principle of emergence where real, unpredictable novelty is generated in the synergy of the transcendence of immanent complexity into new forms. Also, Spinoza's notion of essence applies to finite unities in the sense that any real finite unity will have a tendency to persist in its own being; an emergent function of homeostasis or a "strange attractor" maintaining its emergent form.

In Interface Mathematics, finite unity corresponds to the modelable, volumetric root number 1, of which all others are relative aggregates, relations, higher-functions or compounds (we'll get into this in more depth later).[ii]* Having volumetric extension and a boundary, finite unity can enter into relations with other numbers; it can be added to and subtracted from, divided and multiplied, odded, evened and squared to make endless and indefinite operational sets, or definitions for infinite sets.

Finite unities, as relativities and primitive quantities, must have boundary and magnitude, and in Fuller's "Operational Mathematics"[iii]* as

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[i] From Answers.com: **renormalization**: In quantum field theory (QFT) and the statistical mechanics of fields, **renormalization** refers to a collection of techniques used to construct mathematical relationships or approximate relationships between observable quantities, when the standard assumption that the parameters of the theory are finite breaks down (giving the result that many observables are infinite). Renormalization arose in quantum electrodynamics as a means of making sense of the infinite results of various calculations and extracting finite answers to properly posed physical questions. … Some of the problems and phenomena eventually addressed by renormalization actually appeared earlier in the classical electrodynamics of point particles in the 19th and early 20th century. When calculating the electromagnetic interactions of charged particles …if the electron is assumed to be a point, the calculated value of this back-reaction diverges, essentially because of the singularity at the origin in the inverse-square law.

[ii]* See, The Holarchical Unfolding of Number and Operation, p306.

[iii]* See, Empirical/Experiential Beginnings: Bucky's "Operational Mathematics", p217.

well as herein, they must correspond to properties of real, volumetrically extended modifications.[i] Therefore each finite unity must have a within and a without of this boundary, and this is one of the most fundamental of relative-scope polarities. Finite unity, then, requires "unit-closure" of the emergent intensive forces into the inter-expressive, yet *oppositional* forces of unit-interaction. It is only the generalization and truncation of this infinite depth of detail which sees the separation thereof, but the forces of opposition cannot inter-express or come into play without this emergent unit-closure from the immanent forces of intensity.[ii]*

Buckminster Fuller's most famous and misunderstood maxim, arguably, is "unity is plural and at minimum two." When properly unpacked into the imagination, this enigmatic phrase reveals an important yet deceptively simple duality which opens the way to grasping the fundamental difference (and polar integration) between infinity and number. This concept is also essential to Operational Mathematics because it is the essence of finite volumetric extension and relation and hence is key to sensorial modelability. "A system, says Bucky, is a 'conceivable entity' dividing Universe into two parts: the inside and the outside of the system."[iii¥]

Bucky did not make the distinction between finite and Infinite Unity (above), rather he was dealing exclusively with the finite, as we will address below. With this critical distinction taken into account, however, we arrive at our Principle of Finite Unity as the fundamental tenet of implicit holonic set theory (see *Implicit Holonic Set-Theory and the Part-Whole Axiom*, p207):

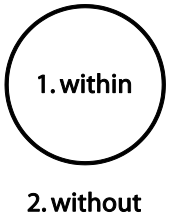

Figure 12: "Finite Unity is Plural and at Minimum Two":
Every surface creates a distinction between the within and the without.

[i] This also corresponds to Alfred North Whitehead's "point-free geometry" where the implicit singularity of the point (in our terms) is exchanged for the relativity of the finite "region," as Whitehead calls it..

[ii]* For much more detail, see Trip-Reset: "Simplest Bodies" and the Self-Similar Kosmos, p586.

[iii¥] Edmonson 25-8

Principle 8: Chord 6: The Quantitative Principle of Finite Unity (or The Principle of Holonic Polarity)

Finite unity is plural, and at minimum two.

Explanation: This principle directly encodes the part-whole relation in the aspect of holonic sets and invokes the symbiogenesis or emergent coupling of a *finite* set with its parent- and sub-sets and vice versa, necessitating that any *finite* holonic set must be a subset of a larger set and must also be composed of subsets; Any whole must be a part of a larger whole and any part must be a whole for smaller parts. This within/without relation is the holonic polarity implicit in *finite*, as opposed to infinite, unity.

In accord with Fuller's maxim, and indeed with his *Synergetic Geometry*—and also for the same basic reasons that Whitehead generated his "point-free geometry"—the smallest *unit* in Interface Mathematics is a *vanishingly small* volumetric point and finite unity. This Operational, modelable and empirically-observable spherical point is herein called a "real-point" to contrast with the unimaginable, unobservable and unmodelable "ideal point" in standard extensionless and non-volumetric mathematics. The real-point, the volumetric finite unity (finity) existing at the limits of visibility, is too small (or far away) for us to see its shape, size or magnitude, so we approximate it with the simplest, most symmetrical shape we can imagine, a sphere. This sphere has the intrinsic duality or polarity specified in Fuller's maxim and our principle of finite unity. The real point is the infinitely divisible "anatom," holon or corpuscle of Interface Mathematics.

The "real point" ideally correlates to the smallest currently observable, empirically deducible, modelable object or arbitrarily selected scale of measurement, and like all objects it necessarily has both volumetric extension and a surface. Therefore all numbers derived from such a real point (as is the case for the numbers in Interface Mathematics) are boundaries or limits[i] as well. And all higher-level numbers made from compositions and relations of this finite unit are also necessarily limited in magnitude because they are multiples or fractions of the unit-number.

The selection of the actual scale for the real-point is fundamentally arbitrary as it is based in variable utility. Indeed, the impetus of this volumetric stipulation is to enable a utilitarian correspondence and resonance—an interface between mathematics and the basic elements of nondual-rational ontology and empirical reality, such as volumetric

[i] As we already discussed, it is the use of ideal non-extended points in physics, the study of physically extended reality, that causes the problematic infinities euphemistically titled "renormalization."

extension, boundary, relativity and modelability. The unit-number, in the real physical operations of nondual rational meta-mathematics, is the selected and generally predefined and standardized unit of measurement, such as a nanometer, centimeter, kilometer or parsec.

This conclusion of both Operational and Interface Mathematics—that all numbers (or magnitudes), as relativities, are necessarily *a priori* volumetric boundaries—excludes from the relational realm of number (or "identically opposes") the quantitative *aspects* of the absolute scope, such as The Infinite (absolute boundless) and the ideal mathematical point (the "inverse-infinite," or "immanent-zero"[i]). The Infinite (1st order), in its original form as the boundless ALL-is-ONE,[ii] is *ultimately* not found or reached *within* the quantitative operations, operators and unities of mathematics, or even within the lines, planes, fields and figures, but it is the infinite, absolute, transcendent and immanent field within and upon which the relative and indefinite game of mathematics is abstracted and played out.

The Infinite is the absolute univocal context which gives the relative, differentiated multiplicity of the finite its inter-expressive meaning (and vice versa) and from which the *aspects* of infinity[iii]*—the infinite lines, planes, volumes and number systems—are abstracted, constructed, transcended and included in the holarchical unfolding of mathematics itself. The forms of unity, therefore, mirror in their relation the fundamental polarity of the Univocity Framework, i.e. that between the absolute and relative scopes. This is simply because the infinite and finite are merely the quantitative or mathematical *aspects* of the fundamental scopes. But even the *directional* aspects of infinity (immanent, transitive or transcendent) cannot ultimately be *reached* or *encapsulated* operationally, and thus mathematically. This is true even though they can be represented and abstracted as "set aspects,"[iv]* and their relative, quantitative and generative properties differentiated and ranked amongst themselves abstractly (and typically in a confused way) as "cardinalities."

This exclusion or separation of The Infinite (absolute scope) from Operational and Interface Mathematics (and the relative scope) may seem slightly misleading when we think of the immanent infinity *within* any number-boundary, but recall our principle (and identity of opposites) of

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[i] what we were also calling the rational-zero.

[ii] Infinity as "boundless" is the form used throughout this work and to which this work presents a return path without relinquishing the fruits of transfinite mathematics and set theory. It simply redefines what a set is and how it relates to the categories of the infinite while resolving the paradoxes that transfinite number theory was attempting to resolve by incorporating the problem into its new and non-operational definition of "infinite".

[iii]* 2nd order Infinities, see Spinoza's Triune Infinite, p270

[iv]* See, Galileo, Cantor and the Transfinite, p442

immanence in transcendence.[i]* In the Univocity Framework, both the immanent and transcendent poles (along with any other infinity) are *aspects* of the boundless absolute, The Infinite, or Nagarjunan Emptiness. Number, on the other hand, conceived as various functions of boundary, is necessarily dealing *within* the world of form, the relative scope, not pointing outside itself to the absolute. To be clear, there is indeed Emptiness or infinity within all numbers, forms and boundaries, and this Emptiness and infinity is the source of number and form itself, but this Emptiness or infinity is never ultimately *reached* or encapsulated in the symbol-system itself. It is always critically *sub-representational*, as Deleuze would say. It is this separation of the absolute and relative scopes that ensures the functionality of the Univocity Framework, and the various forms of the univocal concept of dependent arising.[ii]*

Furthermore, in line with Interface Epistemology, mathematics, as an epistemic, exploratory, unfolding function of the properties of quantitative relation, must also be conceived as an interface gradient (an indefinitely thick "immanent plane") between the immanent and transcendent poles on the immanent/transcendent omni-axis. The simple point here is that mathematics—conceived as the tools invented and in use by man, not the mathematical aspects of reality itself (pure relation) *discovered* by man in this art and science of pure relation—is, in practice and reality, finite or indefinite, and therefore a relative subset of The Infinite Absolute.

The Polarity of Infinity and (Primitive) Number

As we have discussed, volumetric extension is an irreducible aspect of esoteric and Nondual Rationalism, and it is part of the essence of holarchy because with no limits to extension, there can be no extended parts that are not also the wholes of smaller degrees of extension, or smaller parts. For this reason, and as we will explore in depth, any Operational and modelable concept of number must also be extended, i.e. no numbers[iii] (as magnitudes) are meaningfully represented or derived as infinitely small mathematical points (those extensionless points are positions, rather than magnitudes). Therefore, the distinction between infinity and number continues our visual polarity between the formlessness of Emptiness and the boundedness of form. The abstraction is given an experiential and sensorial grounding in the

[i]* "Immanence equals transcendence (and vice versa)," see Principle 3: Chord 2: The Principle of Immanence in Transcendence (Yin in Yang), p95.

[ii]* See, From Dependent- to Tetra- Arising: The Conceptual Embryogenesis of AQAL, p560.

[iii] It must be noted at the outset that number itself is a fused concept that has already been differentiated into at least three main branches, cardinal (magnitude or quantity), ordinal (order or rank), and nominal (a mere label such as #83 on a football jersey). The numbers we will be dealing with throughout this section are generally the cardinals because they deal with quantity and therefore mathematics proper. If and when we discuss the others, they will be labeled accordingly.

causal-logic of extension and, as we will see, this allows it to retain a connection with the causality which, through billions of years of evolution, has informed the innate and powerful imagination of mankind, in its holarchic navigation between agency and communion.

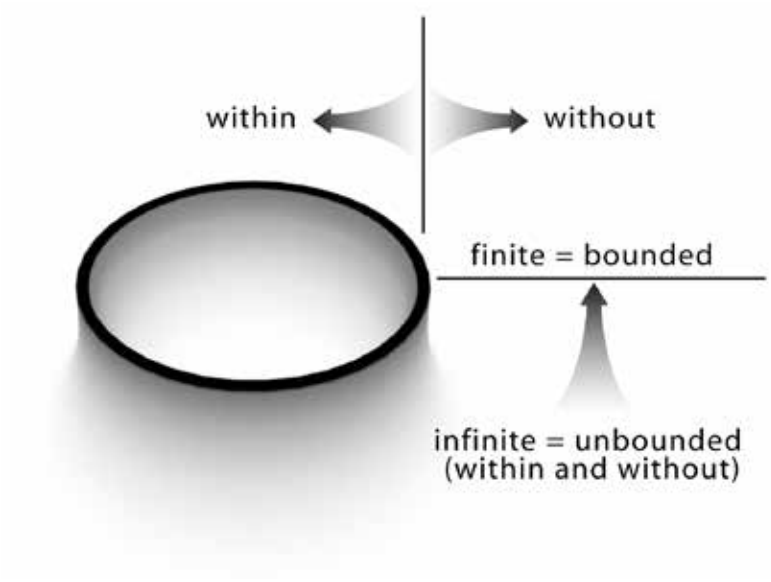

Figure 13: Orthogonality at the Boundary:
This diagram illustrates the orthogonality between the two polarities infinity/number and within/without.

A primitive number or magnitude is a boundary or finite unity—represented in simplest terms by the circle in Figure 13, above—whereas The Infinite is boundless, beyond all conception, perception, magnitude and number, corresponding crudely[i] to the white background, before any boundary is drawn. Note that this polarity is not the same as the polarity of the within and without of the uni-axis upon which this boundary-interface is manifest. The I/T polarity of the uni-axis is—in the sense provided by this representation—*orthogonal* to the polarity of the boundary and the boundless. The polarity at the boundary divides the infinite into two portions, the within and the without, while the orthogonal polarity of the finite and infinite distinguishes infinity as a whole (both within and without together), from the *interface* which divides it, and whose immanent

[i]… and with a strong transcendent-bias due to the plane of the paper image.

substance connects it. This polarity between The Infinite and number means, however, that even the primitive bounded number one is intrinsically infinite—an implicit and encapsulated infinite number. As we will see in detail in the Cycle of Unity, boundary itself comes into being conceptually from the boundless. A polarity, recall, is not just an opposition, but also an identity.

This dual polarity and infinity essential to finity forms another tetrad, which it seems Fuller was not aware of, as it necessitates a fundamental and inseparable distinction (polarity) between The Infinite and number. This is a variation and extension of the polarity of the infinite and the finite, as well as the polarity of its unities, which we already explored.[i]* This is, rather, the polarity of the ONE-ALL and the '1,' as the interface of its ONE-one uni-axis.[ii]*

In Interface Mathematics, once that boundary is drawn (or perceived) a number can be introduced into consciousness, or the imagination, to represent, keep track of, and make use of, the bounded object. Numbers (again as magnitudes) cannot *come into being*, either causally or experientially, and have no function without at least tacitly representing, or being capable of representing, some real, physically-conceived limit—be it known or unknown.

Trans-Trans-Bias: Pre-echo-echo

Note how the image of a boundary on an infinite sheet of paper naturally imposes the intuition that the interior is bounded while the exterior is not. In a very real sense (immanent/transcendent), this is an illusion formed by an objective, transitive or external bias persistent in human psychology. The exterior is just as bounded by this boundary because its substance (or its abstracted directions and freedoms) presses up against the walls every bit as much as does the interior substance. Thus "unity is plural and at minimum two." Every boundary generates two bounded bodies, the within and the without.

But objectively we can see that there is a constant and finite amount of a *specific* material (e.g. paper, or a number of atoms or finite unities of a specific and defined scale) within every boundary, while there may be an infinite or indefinite amount of the same *specific* material external to it (minus the internal portion, removing it from the univocal ONE-ALL). Therefore, another part of the transcendent-bias must be that given a constant resolution of units (finite unities), "infinitely more" will fit outside the boundary than can ever fit within. Therefore, recognition of the I/T polarity, along with our Cycle of Unity (below), requires the transcension of

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[i]* See, The Polarity of the Finite and Infinite (p221) and, Unity and Nonduality (p239).

[ii]* See The (Binary) Cycle of Unity, p254.

boundary itself, as an arbitrary position on the I/T uni-axis, or omni-/non-locally on the omni-axis as a transitive plane.

Note that the transcendent-bias is found in the real properties of a nucleated substrate necessitated in the actual **formation of its matter-unit**[i] because of the real distinction of the "infinite" available "material" (nucleated substrate or transitive plane) outside the boundary as contrasted to the finite resources within the boundary.[ii] This taken into account, the bias has its reality in the emergent generation of the basic unit or "simplest body" at whatever of the infinite "root-levels" or transitive planes of existence we take, and thus even at the "root level" there is substantiality to the transcendent-bias. Given this understanding and recognition, we can counter it accordingly to get beyond its default perceptual restrictions.

Also note that this is a self-recurring trans-foundational theme and that there is necessitated an infinite holarchical "regress" or progress of nucleation—or form from Emptiness—as turtle rests on turtle rests on turtle rests on turtle all the way up and all the way down.[iii] The transitive or transcendent bias is ever-present in differentiated—if sub-perceptual—space and time and infinitely, and holarchically self-recurring, as represented in the uncountable I/T axis.

This "bias" is actually the simple fundamental drive of evolution or "telos" toward ever further transcendence. Such a bias certainly favors the survival and autonomy of the individual to live to reproduce its code. So not only is it a natural and necessary element of the initial formation of any nucleus and basic-level holon, but it is part of the driving essence of evolution itself. Thus we can see this essence as it echoes from nucleated agglomerative substrate into the formation of a higher-level basic nucleus and on into transcension and inclusion up the ladder of holonic agglomeration or the pyramid of development, and at higher levels we see the same initialization process with the stars and galaxies or voids whose frequencies are beyond our ken.

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[i] This will be discussed in much greater depth in SpinbitZ: Vol. II

[ii] This is in order to satisfy the Venturi pressure difference at the interface of motion or spin which creates the bit of matter known as the matter unit. This real pressure difference is what causes the nucleus to condense and differentiate substantially into the basic matter-unit. This is quite literally and viscerally, the initial "contraction in the face of infinity," and it represents the initial move from immanence into the transitive dimensionality as one holon looking out and among many. The contraction is the basic form of agency, while its chemical bonding harmonics and other environmental interactions are the initial acts of communion.

[iii] This is because it takes a nucleated substrate, with its transitive bias, to generate a Venturi effect and a higher-level pressurized and differentiated nucleus … again to be explored more thoroughly in SpinbitZ: Volume II

The (Binary) Cycle of Unity

That blessed mood
In which the burden of the mystery
In which the heavy and weary weight
Of all this unintelligible world,
Is lightened that serene and blessed mood,
In which the affections gently lead us on,
Until, the breath of this corporal frame
And even the motion of our human flood
Almost suspended, we are laid asleep
In body, and become a living soul:
While with an eye made quiet by the power
Of harmony and the deep power of joy,
We see into the life of things.

— William Wordsworth

When, in Interface Mathematics, we first operate pre-mathematically upon the Infinite Unity of the ONE-ALL,[i]* it is really only upon its abstracted immanent multiple *aspect*, the uncountable ALL of infinite multiplicity.[ii]* In the embryogenesis of the concept—differentiating-and-integrating, transcending-and-including from generality to higher and deeper levels of specificity—this pre-mathematical operation is accomplished first through breaking the ineffable abstraction of the ONE into the first polarity represented by the immanent-transcendent omni-axis and the absolute ONE-ALL.

This ALL-ONE omni-axis, recall,[iii]* is the omni-uni of extension because it encapsulates in its concept the entirety of the boundless labyrinth of the continuum of immanent points, each of which is the implicit singularity and immanent pole of an I/T uni-axis.[iv]* Given this, however, it is at the same time the omni-*non*[v]* of position or locality—as we recall from *I/T Omni- and Uni-axes* (p145)—because encapsulating all positions allows no distinction of one position from any other. The omni-axis is *pre-differentiated* with respect to position. Being the pre-differentiated omni-non of position,

[i]* See, The Holarchical Unfolding of Number and Operation, p306.

[ii]* See, Back to Zeno, p448.

[iii]* See, I/T Interfaces, the Omni-Uni and the Omni-Non, p146.

[iv]* Figure repeated from I/T Interfaces, the Omni-Uni and the Omni-Non, p146.

[v]* See, The Omni-Non: The Binary Logic of the Absolute/Relative Interface, p120.

however, the omni-axis is also the omni-non of directionality, and magnitude,[i] because the aspect of position (and its immanent infinity) is requisite to define the existence of any *real* and *modelable* boundary, finite unity and primitive (infinite) number '1' of the first mathematical operation of counting. It is also thus requisite for the compound and much more complex functions of number as well as its magnitude (scale/amount), motion (vector) or directional relation to any other existing *real* magnitude.

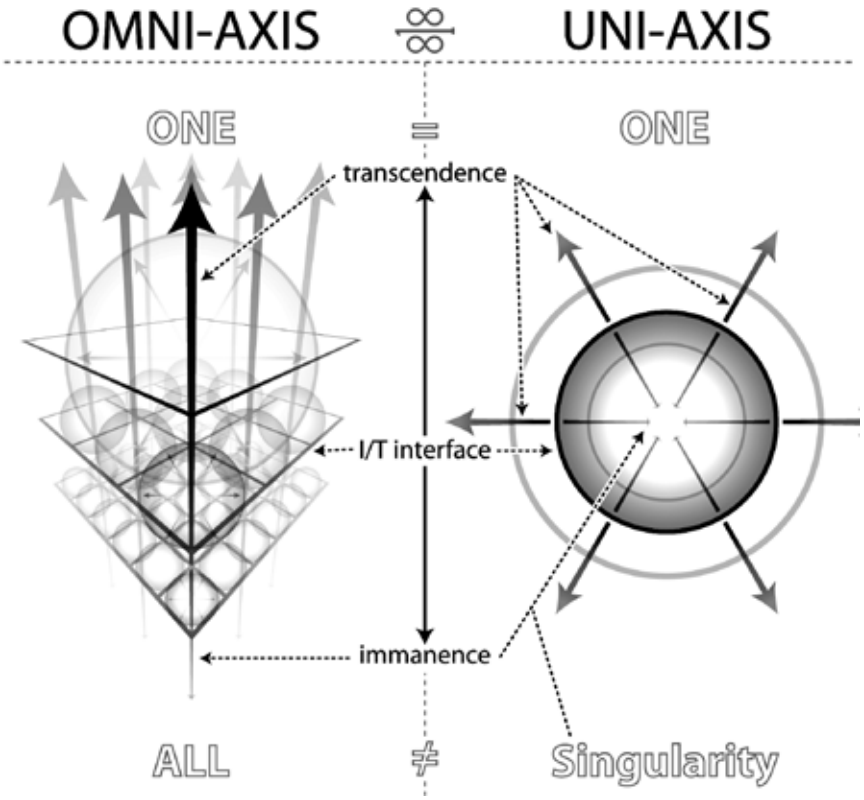

Figure 8: Repeated from I/T Interfaces, the Omni-Uni and the Omni-Non.

This gives us an interesting polarity between the aspects of position and extension (or continuity) when taken at the absolute scope of the omni, or the ALL—which is the uncountable infinite multiple aspect of the ONE of Infinite Unity at which both omni- and uni- axes converge. The aspects of extension and position, when taken at the absolute scope, appear to be

[i] In mathematics these correspond roughly to coordinate, vector and scalar, respectively.

identical opposite of each other. But in *quantitative* terms, the uni-aspect of the uni-axis (the *one* singularity of the *one* axis) is *finite* and the uni-aspect of the omni-axis (the ONE of ALL uni-axes) is *infinite*. The quantitative difference between the uni-aspects of the uni- and omni-axes (i.e. the 'one' and the 'ONE,' respectively), therefore, presents us with the critical relative-to-absolute polarity underlying the Cycle of Unity, as we will see. But recall that this polarity is exactly that of the absolute or infinite *aspects* of extension vs. position already embodied in the two poles of the uni-axis; the ONE and the singularity (See Figure 8, above). Also, recall that we have only two VL-axes in the Vision-Logic Coordinate System. The Cycle of Unity, then, is the binary cycle by which the uncountable I/T axis breaks into the fundamental unit by which to stepwise generate the countable transitive-axis and to begin the agglomerative embryogenesis of mathematics itself.

Because of this, we can conceive of the uni-axis as the VL-axis (vision-logic level axis) of the ONE-one, but 'one' in both the sense of the one singularity, as well as being the VL-axis upon which we can define the *one-boundary and vinculum* of finite unity. This gives us the distinction between the VL-axes of the absolute ONE-ALL (omni) and the absolute-relative ONE-one (uni), and it is critical to note the difference here in terms of scope. The ONE-ALL, note, is fully contained in the absolute scope (as denoted by the CAPS), even if *viewed* through the relative *aspect* of the multiple to give us the infinite ALL. The ONE-one and uni-axis, on the other hand, actually gives us a finite or quantitative aspect in the *single position* of the one singularity hiding at its center. It is thus our first relative polarity (as opposed to an absolute tautology) and conduit from the absolute to the relative scope.

While the omni- and uni- axes converge at the transcendent pole, the interfaces of each are vastly different, recall. The interface of the omni-axis is an unbounded volumetric expanse of a specific scale (a transitive plane), whereas the interface of the uni-axis is the spherical boundary of our finite unity. The polarity between the two I/T interfaces, therefore, swings us from the Unity of the absolute, in the ALL-ONE to the unity of the relative in the unit-interface of the uni-axis. This is the polarity underlying the Cycle of Unity.

The Cycle of Unity begins with the transition, *from* the pre-differentiated, uncountable omni-non of ALL-ONE positions (and thus infinite continuity) shared by the transcendent poles of both I/T axes, *to* the infinitely differentiated 'one' singularity of any particular ONE-one uni-axis. Due to the Quantitative Principle of Infinite Unity,[i] the VLE for Infinite Unity (∞/∞)

[i] See, Principle 7: Chord 5: The Quantitative Principle of Infinite Unity, p245. "Infinite Unity, or its unbounded aspects of infinity, when operated upon, always returns infinity. Thus Infinite Unity is, to coin a term, "inquantate," not quantitative or immeasurable. In nondual terms, Infinite Unity is 'not one.'" Regardless of whether or not the infinity is the Euclidean implicit singularity of the uni-axis, or the infinite multiple of the omni-axis, infinity is inoperable, quantitatively.

is at this point pre-differentiated, and can represent either the omni- or uni-I/T axis. But to move from the mutual ALL-ONE in transcendence to our transitive finite unity, with its one location and bounded magnitude, we must transition from the omni-*non* of position (the omni-axis), to its identical opposite in the omni-*uni* of position (the uni-axis, with its *one* immanent singularity opposite the *ONE*.)

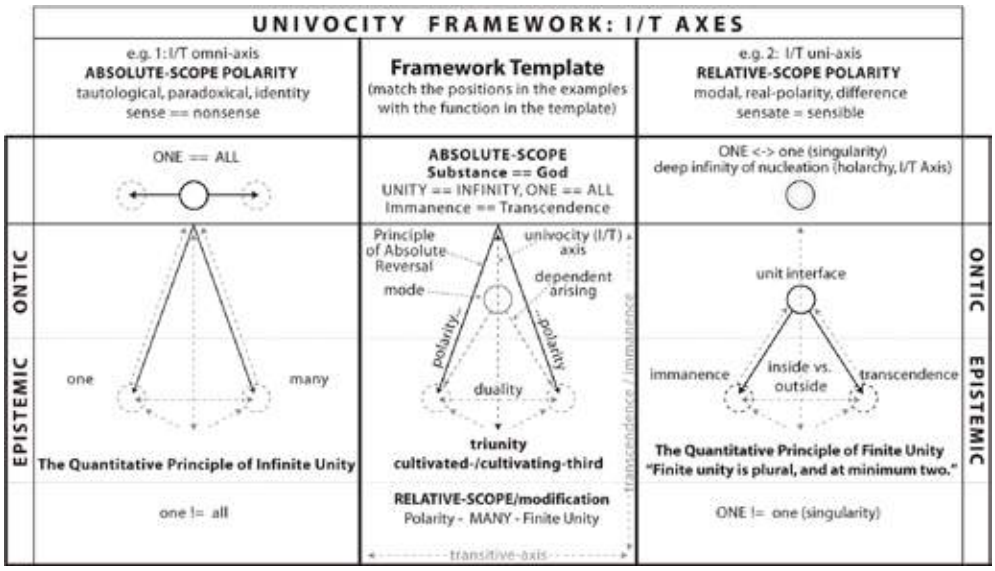

Figure 14: Univocity Framework for the I/T Axes and Interfaces:
This diagram illustrates the I/T axes and interfaces in the context of the Univocity Framework.

Recall that in the Univocity Framework, the ONE-ALL of the omni-axis is an absolute scope polarity, and therefore a univocal tautology,[i]* where infinite omni-local immanence *is* infinite transcendence and the ALL is already contained in the ONE, and vice versa. In this absolute ineffable tautology we can oscillate endlessly, moving everywhere at once and thus nowhere … except for the nondual realization of this identity itself. When, in this oscillation we next reach the transcendent ONE, however—because the omni- and uni-axes overlap at the transcendent pole—instead of flipping back to its identical opposite in the *absolute* ALL, we can transition toward the first true (non-tautological and relative) polarity to touch the relative scope. This is the ONE-one of the uni-axis—where infinite immanence is

[i]* See, Exploring the Univocity Framework, 190.

infinite transcendence in the sense of a true operational polarity between the ONE and the *one*. See Figure 14, above.

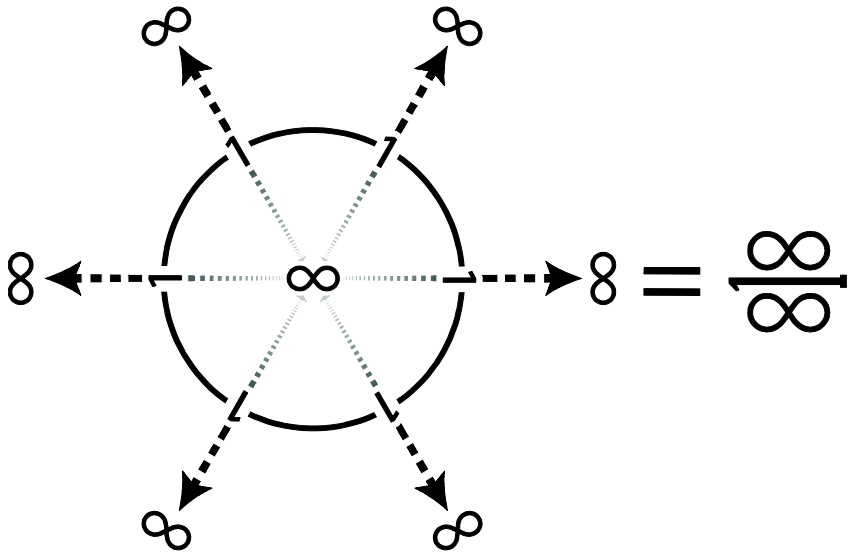

Figure 15: Polarity of the Forms in the Cycle of Unity:
This figure represents the polarity between The Infinite and the finite forms of unity, in the transition from the relative view of Infinite Unity, the ALL, represented by the VLE ∞/∞, to the "one of many" finite unities, identifiable as the holonic, volumetric vinculum/solidus itself or represented simply by 1, our fundamental and primitive number as implicit infinity. Infinite Unity, ONE, is non-quantitative, given that it is unbounded, whereas finite unity is the boundary itself, particularly that between the immanent and transcendent aspects of Infinite Unity and the I/T uni-axis.

From the transcendent Infinite Unity which both VL-axes share, this pre-mathematical oscillation transitions us between them—from The Infinite ONE to a single positional *aspect* of infinity—the implicit singularity of the 'one' of absolute position—but not yet to our *finite unity* of the first mathematical boundary and number. On this I/T uni-axis, a "pre-coordinate" is implicit or emergent as the unit-interface between the immanent and transcendent aspects of the uni-axis. This boundary breaks the infinite ALL of the absolute ONE into the relative scope "one of many."[i]* This boundary can be located or derived at any position on any arbitrarily selected immanent/transcendent uni-axis. See Figure 15, above.

[i]* See, Finite Unity: "Unity is Plural and at Minimum Two", p246.

It must be emphasized that the "division" and interface, represented by the solidus/vinculum of the VLE ∞/∞—in both the ONE-ALL of the omni-axis and the ONE-one of the uni-axis—is not properly considered a mathematical operation. These are, rather, pre-mathematical, conceptual operations symbolized after-the-fact in mathematical terms as indicated by the meta-mathematical and vision-logic level of the VLE. We speak of division here only in the sense of the embryogenesis of the concept (EOTC) from ineffable transcendent-biased Unity into both of these immanent-transcendent polarities, rather than in the sense of a mathematical ratio which, at a higher level and function of number, violates the closure property of the finite unity of the integers and generates a whole new infinite set, as we will see.[i]*

At this level in the developmental holarchy of mathematics there is yet no first number or quantitative variability with which to form a differential ratio. Nor are the *a priori* immanent-transcendent omni- and uni- axes, their holonic solidus/vinculum interfaces and the continuum yet limited to the magnitudes producible/reachable by the higher function of the ratio, with its Dedekind cuts, etc. There is, at this point in the EOTC of mathematics, only the pre-differentiated Infinite, absolute boundless, formless, logical Emptiness or absolute Unity, abstracted into an undifferentiated "multiple aspect," the infinite multiplicity and continuity of the ONE-ALL.

As such, none of these pre-mathematical operations has any immediate bearing on mathematics itself, except insofar as the *understanding* of mathematics is concerned, and the effects this meta-mathematical *understanding* could have on its evolution. This is simply meta-mathematics, which is generally considered frivolous to mathematicians unconcerned with the philosophy of their subject, and likely, in that case, with philosophy in general. But in my case, this understanding, and in particular the understanding to come, greatly helped in my own studies of mathematics and in passing my exams, so it has a clear practical value.

From this pre-differentiated multiple aspect in the ALL we begin the embryogenesis of operation and number. But only through a "breaking of symmetry"—from the absolute scope of Infinite Unity, through its aspect in absolute multiplicity, and ultimately into the relative scope of finite unity[ii]—can mathematics proper[iii] even begin. And it must begin at square 'one'; literally with the finite unity of the primitive number '1,' which itself is an enfolded implicit infinity, a "bounded infinite" and primitive infinite number

[i]* See, The Holarchical Unfolding of Number and Operation, p306.

[ii] We can already see the Triune Infinite in this interface of The Infinite and finite.

[iii] Mathematics in the common sense of operations on pre-existing numbers returning differentiated answers.

as pure-relational counterpart to Spinoza's "simplest body" which we'll explore in great depth later.[i]* In the real-world as empirical correlate, this manifestation of our primitive finite unity takes place as the emergence of whatever modification is the *bounded object*, and set thereof, of the first primitive mathematical operation of counting. Such manifestation always takes place in a sub-representational arena, beneath and before the *representation* of mathematics itself, and so in the embryogenesis of the concept of Interface Mathematics as well.

The common tendency to take the immanent pole of this uni-axis—our familiar "zero-dimensional," "infinitely small" "mathematical point"—as our finite unity and first number must be resisted, because unlike our first "natural" numbers, this point is unbounded, an implicit singularity, and hence an infinite logical-Emptiness, not a finite, form. It is actually not a unity at all, but an implicit singularity; *a single pole of an unbounded polarity*, and ultimately merely an immanent positional *aspect* of Infinite Unity.[ii]*

So we have painstakingly transitioned from the ONE to the ONE-ALL to the ONE-one and its interface in finite unity. At this point (after manifesting the 'one' of the holonic solidus interface) the necessary pre-differentiated equality of the pre-mathematical ratio, ∞ / ∞ —which, in a mathematical equation (if we were not dealing the pre-mathematical Infinite), would normally return '1'—then returns us back to the pre-quantitative, absolute and transcendent ONE of Infinite Unity which both the uni- and omni-axes share, completing the cycle of absolute and relative unities. See Figure 16, below.

$$\text{ONE} = \text{ALL} = \frac{\infty}{\infty} = \text{ONE}$$

Figure 16: VLE of the Cycle of Unity:
This VLE symbolically represents The Cycle of Unity. Note that the vinculum in the statement ∞/∞ is a 1, representing the 1 of finite unity as the boundary on the immanent/transcendent uni-axis.

The Orbit of Unity

To make this more visceral and tangible, and to provide us with useful tools for the Triune Infinite, The Cycle of Unity can be visualized as an eccentric orbit; a univocal cometary journey of representation from the dark, vast

[i]* See, Trip-Reset: "Simplest Bodies" and the Self-Similar Kosmos, p586.

[ii]* See, Spinoza's Triune Infinite, p270.

reaches of Infinite Unity or Emptiness, swiftly past the upper complexities of "higher mathematics," hurtling inward to the bright, primitive origin-point of the relative in mathematical representation; our finite unity and primitive number '1.' After briefly grazing the surface boundary of this origin of mathematics, we swing back again, out into the ineffable Emptiness of sub-representation and pre-mathematics, Infinite Unity and the absolute scope. See Figure 17, below.

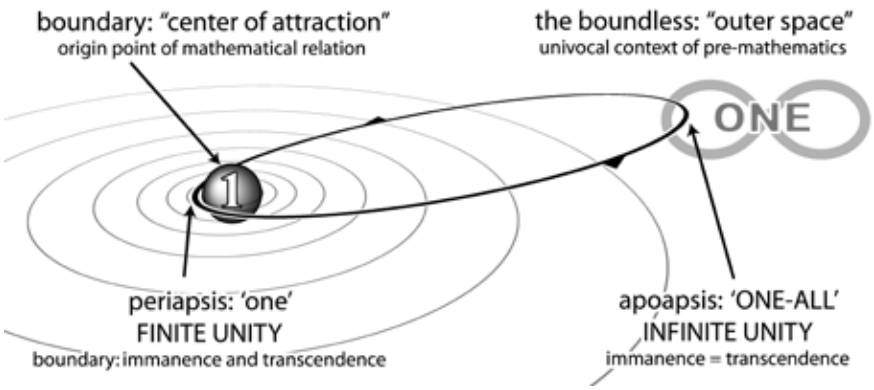

Figure 17: The Orbit of Unity:
This image represents The Cycle of Unity in the image of an eccentric orbit. Towards the "center of attraction" in the analogy, we approach the boundary between immanence and transcendence in the solidus/vinculum of the VLE ∞/∞ and moving outward, toward "outer space," we approach absolute and Infinite Unity.

Beginning in the outermost regions of the orbit, in the slowness of our distant position we can afford the time to download some terminology needed to properly explore our next journey, and for use later in this book. In astronomy, the *apsis* of an elliptical orbit denotes the point of greatest or least distance of a celestial body from its center of orbital attraction. The *periapsis* is the closest approach—in this case, the point of originary *contact* with mathematics in the representation of the object of counting via our primitive finite unity, the number 'one.' The *apoapsis*, on the other hand, is the furthest point—in this case this outermost position from the primal unit-boundary of mathematics is the return to its identical opposite, the pre-mathematical, inquantate Infinite Unity of the unbounded ONE-ALL. Along the way, we must pass through many other regions of complexity necessary for the journey, but only briefly as we speed inward to the center of our focus.

At the outer-reaches and apoapsis of our orbit, we are in the domain of Infinite Unity, the ineffable absolute scope. In its nondual or univocal form

this can be written as "ONE is ALL" (i.e. Unity = Multiplicity), and in its relative and purely immanent[i] form as the multiple *aspect*, the ALL. From the absolute ONE of Infinite Unity, we break from the stalled symmetry of our orbital apoapsis, falling from the ONE-ALL of infinite complexity toward the infinite focus and implicit singularity of the first polarity to touch the relative-scope, the ONE-one and uni-axis. We pass swiftly through the orbital clouds of higher-mathematics and arrive at the cultivated third of this first relative polarity giving us the primary boundary needed for our nondual-rational vision-logic interface understanding of the embryogenesis of mathematical operations.

Nearing the point of closest approach, from this relative view—embedded in the representational "orbital dynamics" of the infinite ALL and its ONE-one uni-axis—the absolute scope of Infinite Unity can be further abstracted (represented in either its omni- or uni-axis forms) and written by the VLE statement; ∞/∞. For a brief moment, the periapsis of our orbit is now distinctly in view. It is the division center of the vinculum/solidus; the closest point in our orbit to the first meta-mathematical boundary of form and duality, but the furthest from the nondual identity of immanence in transcendence (yin in yang); the vastness of logical-Emptiness and Infinite Unity, respectively. Accelerating us on in the fastest portion of our orbit the equality of the representative VLE-ratio quickly returns us, in its pre-mathematical unbounded function, to the ONE of Infinite Unity, flinging us back into the vast Emptiness from which we came.

The Double Orbit

The observant reader will be struck by the inadequacy of the orbital analogy. It is clearly imbued with a transcendent-bias … of all things. This can be seen in the simple fact that the *outer* vastness of space represents both transcendence *and* immanence whereas the inward direction moves us toward its VLE division in the solidus/vinculum boundary. We can, however, turn the unbalanced analogy inside-out, flipping the immanent-transcendent polarity. Instead of approaching the boundary of the unit-number from the outside, we can approach it from the infinite depth within and return to this depth from whence we came on the outbound leg of the journey.

Combining the two analogies into one, however, provides a more integrated, balanced and complete view of the unity and distinction of this most critical immanent-transcendent polarity. The goal in both cases is still the approach towards the primitive *boundary* and origin point in Interface

[i] …in the sense of "immanence in transcendence."

Mathematics, but now we approach it from both directions, simultaneously, i.e. from both immanence and transcendence.

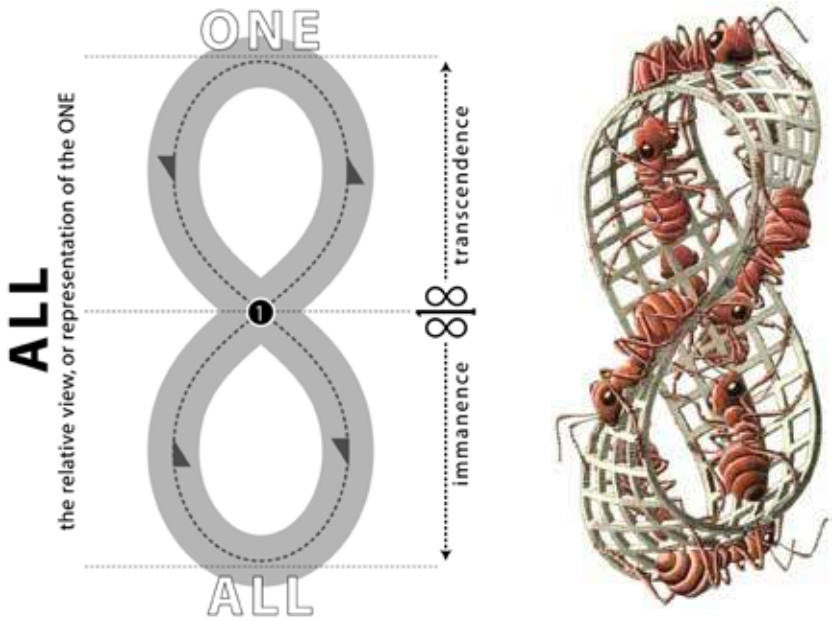

Figure 18: The Double Orbit of Unity (ant mobius image from M.C. Escher):
This diagram illustrates the mobius-aspect of the Orbit of Unity analogy, in that the outer leads to the inner, and vice versa. This image is superior to the orbit of unity because it transcends the transcendent-bias to show the immanence in transcendence of the ONE-ALL. In this diagram, the 8 represents the ALL which is the relative view of the ONE. The apoapses of both the immanent and transcendent loops represents the limits of representation, and the self-crossing represents the location of the unit-boundary and primitive number 1 of our finite unity between immanence and transcendence.

To do this, instead of using a circular orbit, we use a figure eight. This figure is the traditional symbol of infinity, the "lazy eight," but turned upright; perhaps to denote the awareness of the transcendent-bias in mathematics and adopted in the ratio of our VLE. For the sake of convention, but now in full awareness of the bias, the top loop of our figure-eight, represents transcendence and the bottom, immanence—as in our VLE ∞/∞, and the standard positions in the mathematical ratio. The return point of each—both the top and bottom extremes of the eight—still represents our apoapsis, the ONE-ALL, respectively, but this time we can see it more clearly

as the limits of representation itself. These indefinite limits appear precisely as we turn for home after tiring of our infinite exploratory journey in both immanent and transcendent directions simultaneously (e.g. the Planck scale and the limits of the visible universe). In this sense, the eight itself represents the limitations of the relative view of the ONE as the ALL, while the ONE-ALL itself ultimately remains beyond representation. See Figure 18, above.

From the dark, sub-representational vastness of our dual apoapses of Infinite Unity, we approach—in both immanent and transcendent directions simultaneously—the central finite boundary and origin-point of Interface Mathematics. This double motion is denoted by the triangular arrows on the 8-path. Note how this figure can also be seen as our familiar mobius strip, with the motion, beginning on the outside (transcendence, or yang), naturally ending up on the inside (immanence, or yin), and vice versa.

Where the two paths cross and immanence becomes transcendence, we have our unit-boundary, finite unity and primitive (infinite) number 1. This first boundary in Interface Mathematics occurs precisely where we arbitrarily determine it to be, and this is generally half-way between the limits of representation in both immanent and transcendent directions. This can be seen, in the real world of scientific/empirical mensuration,[i] in the fact that the meter—the scale of "man, the measure of all things,"—is almost exactly half-way between the assumed immanent and transcendent limits of reality itself, namely the Planck scale and the size of the visible universe, respectively. From either direction, both immanent and transcendent, the meter is divided or multiplied (respectively) into deeper layers of unit scales with their own exponentiating prefixes—deci/deka, centi/hecto, milli/kilo … and so forth, in both directions, all the way in and out to … yocto/yotta, and beyond.

Spinoza, the Infinite, the Indefinite and the Imagination

Spinoza makes an important clarification to the polarity of the finite and The Infinite, but he places his emphasis between the Infinite and the imagination (i.e. representation), which he sees necessarily as finite, given its modal nature and what we are calling its relative scope in the world of form.[ii] This difference, he says in his famous *Letter XII* on the Infinite, is crucial to untangling the confusions surrounding the infinite (as we will very soon see). The Infinite is "that, which can be understood but not imagined" and

[i] i.e. measurement.

[ii] Technically, the imagination, or representation, is the epistemic level of the world of form, or what the Hindus/Buddhists call Maya, the *real* world of *real* illusion.

the finite is "that which can [be understood and] also be imagined."[i¥] This is the primary scope distinction between absolute and relative—the fundamental polarity of the Univocity Framework—rendered in terms of the multiple or quantitative aspects of the imagination, and the limitations of the forces of representation.

In Spinoza's view, all images or representations are part of the relative and finite (or indefinite) imagination. This would then include perception and conception, while the reality of this necessary representational illusion of sensation and other forms of the imagination is our qualitative connection, our interface *with*, and *as*, reality (and specifically a finite unity thereof).[ii*]

Accordingly, the most primitive form we will explore in the embryogenesis and holarchical unfolding of Interface Mathematics is the very first Operational number, form, boundary and finite unity in contradistinction to The Infinite and its ineffable and inoperable Unity, as discussed above. This primitive unit-number is necessarily represented by an image in the imagination or a real object of relative perception, already designated herein by the appearance of the circular boundary on the white paper in Figure 13, above (p252), but it is also the *real* object being counted in the primitive forms of mathematics from whence we derived the natural numbers. The Infinite, however, exists beyond, or prior to, any image or boundary being introduced and thus beyond the imagination. Both the infinite set of all possible real numbers and a space of infinite extent are impossible to encapsulate in one's imagination yet they are quite easy to understand logically and procedurally. Just imagine endlessly counting by ones, or multiplying by some recursive, set-generating algorithm, or imagine an endless expanse of space, a horizon with no boundaries.

This imagination is the indefinite. The interfacing of The Infinite with the finite forms of time. Through logic and intuition, we must then *assume* that it simply goes on "forever" because we can't get there in our imaginations. Thus infinity is simple to *understand* through the rules of logic and with the *help* of the imagination, but it is impossible to *visualize*, imagine or encapsulate *as a totality*. The best we get with the imagination is the indefinite, not the infinite.

Therefore, as the rationalists correctly noted, the abstract understanding, reason or rationality, coupled with the intuition, can grasp things (at least relatively so) of a general and symbolic nature extending beyond, or transcending *and including* the capabilities of the detailed imagination, including both objective and subjective forms such as perception. The

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[i¥] *Letter XII* (B. D. Spinoza)

[ii*] See Spinoza's Attribute Polarity and "The Nucleation of Observability" in this book and the discussion on the Emergence, Mnemonic Primitives, and the Symbiogenesis of Subject and Object, p528.

higher levels of concept, such as logic and reason, can (and should) transcend and include percept. An *understanding* of infinity is therefore always necessarily a conceptual abstraction based on the mnemonic foundations at the interface of perception/conception, just as every modification is an abstraction from the infinite itself. But without the imagination and its foundational perceptions to aid in the process of transcending itself, there is no understanding of the finite or the infinite.

A Note on Fuller's Finite Absolutism

In light of this analysis, it is odd that Fuller seemed to conceive of "Universe" as necessarily finite in extent. Fuller took onboard the reigning positivistic baggage in saying that since the infinite is *beyond the senses* (and imagination) and cannot be included in the range of empiricism and Operational Mathematics, then it also cannot exist in reality (or more correctly, *as reality*). However, his principle that "unity is plural and at minimum two" inherently negates such an absolutistic conclusion (not to mention the performative contradiction inherent in positivism). As we have discovered, the "unity" that Fuller is talking about is the finite or bounded unity. The duality of every finity necessitated by Fuller's own principle of mathematical unity negates its own absolute status because, according to this principle, a fundamental polarity extends omni-directionally within and without every surface, transcending it in both directions by definition. In other words, as soon as a boundary is introduced for the extent of Universe, its magnitude is surpassed by the necessity of an outside in relation to an inside.

This is perhaps better understood with a simple example; every number can be doubled, thus every time you think of the infinite as a number you can, in principle, instantly double it or even add one to it. Conceiving of number as a boundary, therefore, Fuller's fundamental polarity necessitates that there is a beyond to every conceivable limit and thus there can be no final boundedness to Universal space; and working inwardly from the same principle, there can be no smallest conceivable volume.

One feasible recourse for Bucky to maintain his finite Universe[i] would be an appeal to non-Euclidean geometry, but this falls outside his definition of Operational Mathematics and the stipulation of experiential modelability, and it also renders his Principle of Operational Unity as problematically and arbitrarily special case, given that it would not apply to the unity of

[i] Unless of course Bucky's Universe was only dealing with the finite realm of observability, which would fit with his notion of modelability, but it would necessitate his unrecognizing of the fundamental distinction between the finite world of mathematics and the Infinite. It would mean that Bucky did not recognize that the boundless, in principle, cannot be encapsulated in the realm of the bounded, but vice versa. But then he likely didn't study Spinoza or Leibniz.

Universe. The finite unity (boundedness or finity) gives rise to duality and only the Infinite Unity (boundless ALL and absolute scope) can be truly ONE and non-dual because it contains and exfoliates all polarity.[i]

Bucky is correct, however, that infinity does not properly *operate within* physics, observation or mathematics. He is right that The Infinite is not to be found *within* any finite descriptive (subjective or objective) system, but he neglects the inverse conclusion (necessitated by his own principle) that all finite systems or wholes are to be found within, and necessitated upon, a greater *sub-meta*-representational system or whole, and ultimately upon the *infinite division equals indivisibility* or continuity of the fundamental Principle of Nondual Rationalism. That nondual continuity as infinite discontinuity (and vice versa) is the only thing capable of "giving rise" to a boundless series of possible boundaries in the embryogenesis of the concept of Universe.

[i] This is another route for Spinoza's "escape" from the mode to arrive at infinite and continuous substance.

THE TRIUNE INFINITE: INTERFACING EMPTINESS

According to the evolution and embryogenesis of the concept, polarities generally differentiate and integrate to triunities, or cultivated thirds. What then is the cultivated third of the polarity we just explored between The Infinite and the finite, or more properly between the quantitative *aspects* of the absolute and relative scopes? As we will see, the interfacing of the finite (relative scope) with The Infinite (absolute scope), necessarily results in a triune organization; the Triune Infinite, first explored in detail, perhaps, by Spinoza. Due to the simultaneous, nonlinear (and rhizomatic) nature of these concepts, we have already seen many of the features of the Triune Infinite in action; sometimes implicitly, and sometimes explicitly, such as the unfolding "aspects" of The Infinite, which we will flesh out in much more detail below.

Indeed, it is fascinating to note that many thinkers, for whatever reason, have independently come to the same general conclusion of three types or degrees of infinity. These include Giordano Bruno, Spinoza, Hegel and even Cantor, as well as many others. It is even found in the field of psychology with H. Wilkinson's "three infinities in psychoanalysis."[i¥] It was found all over in medieval texts and even in the hermeneutic wars over the nature of the holy trinity; e.g. are there three separate and infinite Gods or merely three aspects of the one infinite God? In most of these cases, it is only the tripartite nature that these incidences seem to have in common, but there may be more than co-incidence at work here in this relative interface of the number three with the absolute scope or the divine.

Cantor's Three Infinities

As mentioned previously, Georg Cantor also had a three-fold categorization of the infinite, but his system doesn't *quite* map exactly to the three degrees discussed herein, as we will see, and it leaves some critical gaps. Cantor says, "The actual infinite arises in three contexts: first when it is realized in the most complete form, in a fully independent otherworldly being, *in Deo*, where I call it the Absolute Infinite or simply Absolute; second when it occurs in the contingent, created world; third when the mind grasps it *in abstracto* as a mathematical magnitude, number or order type."

[i¥] Wilkinson H. . Psychoanalysis as finite, psychoanalysis as infinite? Psychoanalysis' religious potential: International Journal of Psychotherapy, July 2003, vol. 8, no. 2, pp. 147-168(22)

Given that, for Cantor, mathematical infinities only occur at the third level, that of abstraction, or what we would call representation, it is important to note that none of Cantor's revolutionary transfinite mathematics deals at all with our absolute scope, The Infinite or the ONE-ALL of univocal Emptiness. All of Cantor's work is strictly at his own third order of infinity, *in abstracto*; the realm of the relative scope and the forces and limitations of representation, with its inability to ultimately or *absolutely* encapsulate the absolute scope and its abstracted quantitative *aspects*. Recall that this is the critical feature of the Univocity Framework and the nature of the nondual and Nagarjuna's Emptiness. This feature alone, of Cantor's metaphysical context—if grasped by those mathematicians and philosophers of mathematics who take issue with Cantor's work—could perhaps get us much of the way toward a resolution of the controversies at the heart of modern "axiomatic" set theory. We'll explore this in much more depth later.[i]*

Spinoza's Triune Infinite has a slightly different, less transcendental and less theological mapping. In univocity there is no "fully independent *otherworldly* being" because the ALL *is* the ONE in Substance and its infinite modifications. But Cantor may be intuiting the absolute/relative scope polarity as an *independent* duality, and generally from a transcendent-bias. In this sense his 1st order can be seen as the absolute ineffable scope of The Infinite, or the ONE, and his 2nd order can be seen as the relative scope view of the absolute, or the ALL of infinite multiplicity as it appears in the "contingent" reality of modification. His 3rd order, however, appears to be merely a catch-all for all possible *representational* and quantitative infinities, namely those of mathematics, which is then where we find the infinite levels of infinities of his transfinite sets; all merely 3rd order mental abstractions of "mathematical magnitude, number or order type(s)." So, essentially, Cantor's three infinities can be expressed as Absolute, Ontic, and Mathematical (this last category of mathematical infinities is merely a *subset* of the epistemic or representational forms of the infinite (aspects), i.e. mathematics as the representation (art/science) of pure relation).

We will find a slightly different mapping in Spinoza, and one that is far more useful for making *sense* of the polarity of The Infinite and finite, and the paradoxes that they have inspired. We will find that Cantor's loose set of types leaves out several critical distinctions. Indeed, Cantor's third distinction is not a distinction in *kind or degree* of infinity, but merely based on where it is found—in Cantor's specialty, Mathematics—and, most critically, it makes no room for *non-mathematical* forms of representational infinity, such as those found in philosophy and the epistemic modes of ontology.

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[i]* See, Galileo, Cantor and the Transfinite, p442.

Clearly, however, there is a great deal of collective intuition behind this basic idea of a triunity in the infinite, and the following will flesh it out in detail demonstrating some of the value behind this vast historical impetus.

Spinoza's Triune Infinite

In Spinoza's famous letter to Meyer—his *Letter XII* on the infinite—we find a brief outline of three types or degrees of infinity, which Spinoza presents as the embryonic key to reconciling the common problems (paradoxes etc.) in philosophical and mathematical conceptions of infinity and the absolute. Spinoza says, "Everyone regards the question of the infinite as most difficult, if not insoluble, through not making a distinction" between his three-fold infinite (below) and his polarity of infinity and the imagination, which we already discussed in the previous section.[i*] Spinoza goes on:

> If these distinctions, I repeat, had been attended to, inquirers would not have been overwhelmed with such a vast crowd of difficulties. They would then clearly have understood, what kind of infinite is indivisible and possesses no parts; and what kind, on the other hand, may be divided without involving a contradiction in terms. They would further have understood, what kind, of infinite may, without solecism [[i.e. error]], be conceived greater than another infinite, and what kind cannot be so conceived.

Spinoza goes on to elucidate these distinctions in detail, but, through the visual polarity of infinity and the imagination and the Vision-Logic Coordinate System already outlined, we will simplify and clarify these distinctions and make them visible to the imagination and hence far less abstract. In the process we will significantly expand them into a vision-logic interface for the infinite and the finite and fill in many details missing from Spinoza's sketch.

It is commonly thought that Leibniz's own nearly identical Triune Infinite, was developed independently of Spinoza. But in *the Courtier and the Heretic,* Mathew Stewart demonstrates that Leibniz sought out, and secretly[ii] copied down Spinoza's famous letter on the infinite [my ***emphases***].

> In April 1676, Leibniz's interest in Spinoza began to take on the character of an obsession. … he managed to get his hands on a ***thirteen year old*** letter from Spinoza to his friend Lodewijk Meyer concerning the nature of the infinite and other topics. Leibniz copied out the letter—which

[i]* See, Spinoza, the Infinite, the Indefinite and the Imagination, p264.

[ii] likely out of fear of being associated with the "infamous Jew" and his heretical ideas

> extends for half a dozen pages—then added marginal notes of his own as lengthy as the original text (p187).

According to Samuel Levy (in his *Leibniz on Mathematics and the Actually Infinite Division of Matter*), 1676 was the year of Leibniz's Spinoza studies and the year he solved his problem of the "labyrinth of the continuum" and the infinitesimal of the calculus by recognizing "infinitely small" points not as *a priori* composing the continuum but as *a posteriori* "termini" abstracted from the *a priori* infinite depth of the continuum.[i]* These points as termini are what we will come to see as Spinoza's 2nd order infinities, and it is likely that Leibniz drew this inspiration from reading Spinoza's "thirteen year old" *Letter XII* on the infinite, where he made this distinction (used throughout his Ethics, I will argue) its most clear. And recall again that this is what Deleuze extracts from Leibniz as the idea of the "fold," converting his infinitely divided monadology into an infinitely folded and unified one.[ii]*

Whether Leibniz invented the Triune Infinite independently thirteen years later or customized and began to use Spinoza's Triune Infinite as his own without attribution—given Spinoza's heretical and *dangerous-to-know* status—is still an open question. Regardless, as with the bulk of Leibniz's reaction to his own secret Spinozism, there is much novelty and value that Leibniz brings to the subject.[iii]

There is no doubt, however, that Leibniz and Spinoza shared the Triune Infinite regardless of priority. In the transcript to a 1981 audio-taped discussion, Deleuze states:

> And Leibniz, who was himself a very great mathematician, who had knowledge of the letter to Meyer, declared that he particularly admired Spinoza for this geometrical example [which we will explore below] which showed that Spinoza understood things that even his contemporaries didn't understand, said Leibniz.[iv¥]

And Jim Macdonald says in his paper Spinoza and Leibniz: A strong Affinity:

> Leibniz liked Spinoza's characterization of the three infinities, although he said he was accustomed to call them by different names. Nevertheless, he saw Spinoza's division as pretty much the same as his.

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[i]* We'll explore this connection further in the section on the calculus (see Reconnecting the Lost Thread of Mathematical Rationalism: Spinoza, Leibniz, Immanence and the Calculus, p400).

[ii]* See, The Identity vs. the Opposite: Post-Modern Con-fusion and Pre-modern Naiveté, p221.

[iii] Indeed, as we will see (see The Spinozan Catalyst in the Triune Infinite, p407), Spinoza's Triune Infinite led Leibniz to his rejection of the idea that the continuum could be made up of mathematical points, and hence to his (currently neglected) resolution to the problem of the infinitesimal and the calculus.

[iv] ¥ Gilles Deleuze: Cours Vincennes - 20/01/1981 : <http://www.webdeleuze.com/php/texte.php?cle=191&groupe=Spinoza&langue=2 >

And Macdonald continues, quoting Leibniz from his notes, and providing us with a succinct introduction to the Triune Infinite:

> 'I usually say that there are three degrees of infinity. The lowest is, for the sake of an example, like that of the asymptote of a hyperbola; and this I usually call the mere infinite. It is greater than any assignable, as can also be said of all the other degrees. The second is that which is greatest in its own kind, as for example the greatest of all extended things is the whole of space, the greatest of all successives is eternity. The third degree of infinity, and this is the highest degree, is everything, and this kind of infinite is in God, since he is all one; for in him are contained the requisites for existing of all the others.'[i¥]

Note that Leibniz says that all of the degrees of infinity share one thing in common, they are "greater than any assignable." This basically means that, in their respective levels and domains, they are unbounded, as we have established for the esoteric and nondual understanding of infinity, as the quantitative aspect of the absolute scope. It is also worth noting that Leibniz's own language of "the greatest" seems to imply an actual magnitude and thus a boundary, the greatest one, as opposed to the boundless. This is, however, merely a consequence of rendering the infinite in relative terms such as magnitude.

Leibniz categorized his degrees of infinity from lowest to highest, from the first to the third degrees, respectively. In light of the embryogenesis of the concept, however, we will work in the inverse direction, starting with Infinite Unity as the first order and working into the lower orders in terms of differentiation into larger numbers and working down into the relative view of the absolute, from the ONE of Infinite Unity to the ALL of absolute multiplicity and into the ONE-one of the uni-axis and its finite unity and implicit, intrinsic singularity.

Order 1: The Absolute Infinite

The 1st order Infinite is "The Absolute," the ALL is ONE, the "Boundless ALL," our absolute scope, Emptiness and Infinite Unity which is not 'one.' Spinoza describes it in his *Letter XII* as, "…that which must be infinite from its very nature, or in virtue of its definition." And Leibniz says, "…the highest degree, is everything, and this kind of infinite is in God, since he is all one; for in him are contained the requisites for existing of all the others." This is the ineffable absolute; enfolding and unfolding all other possible infinities, polarities and forms of difference. This is also the "axis of Tao" denoted and operationalized herein by the second order immanent/transcendent *omni*-axis.

[i¥] Leibniz; Notes; qtd in Macdonald

Alexander R. Pruss in his paper *Can Two Equal Infinity? The Attributes of God in Spinoza*, calls this 1st order Infinite the "Absolute Infinity." He says, echoing our principle of Infinite Unity,[i] "Something infinite in this sense cannot be broken down into parts." For the absolute scope to be broken down into parts or divided, would first require a relation between divisor and dividend, and barring that, it would require a division of infinite depth. This "kind of infinite is indivisible," as Spinoza mentioned, but it is *indivisible* precisely because it is infinitely deep or *infinitely divided*, as Leibniz would emphasize. The Absolute Infinite is the "infinite division equals indivisibility" of the fundamental Principle of Nondual Rationalism. The Infinite, being Absolute, cannot, by definition, possess internal relations. The instant such relations exist, we are again at the relative scope.[ii]

And echoing Spinoza, Pruss continues, "This kind of infinity is only conceived by the intellect, not the imagination." The imagination is always exhausted in a finite amount of time and therefore can only ever reach a limited, indefinite depth of extension (transitive), division (immanence) or time.

Order 2: The Aspect Infinite

The Aspect Infinite is the second order infinity and it derives its infinite nature directly from the first as unfolding aspects, perspectives, infinite modes of being or mental abstractions from it. The Aspect Infinite mediates as a cultivated third or a triune-interface between the first and last orders of infinity, just as Spinoza's attributes mediate the expression between Substance and its modes,[iii]* just as Leibniz's "pre-established harmony" mediates between God and the subjective and objective monads[iv] and just as our relative-view ALL mediates between the ONE and the one.[v] See *The Triune Infinite and the* Triad of *Substance,* Attributes and Modifications (p286), below.

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[i] "*Infinite Unity, or its unbounded aspects of infinity, when operated upon, always returns infinity.*"

[ii] But again, it is important to note that the absolute and relative scopes are not locations, or scales of interaction in a relation of reduction, one to the other. They are, rather, the basic conceptual contexts from which the mind attempts to make sense of the world and itself. Indeed, the absolute scope only comes into the conceptual field of view when the relative scope attempts to relativize itself in order to find its context in its identical-opposite. And thus the bounded relative scope must find its basis and meaning in the boundless absolute scope and the concept comes full-circle to grasp its genesis in the pre-conceptual, and the finite in the infinite. See "Vertical" Polarity: The Polarity of Polarity, p175.

[iii]* See The Triune Infinite and the Triad of Substance, Attributes and Modifications, p285.

[iv] God and monad together form the "supreme Gonad," but that is beyond the credulity of this book.

[v] And we can also see parallels here between the mediation of Jesus between the ONE God and the one-many of humanity.

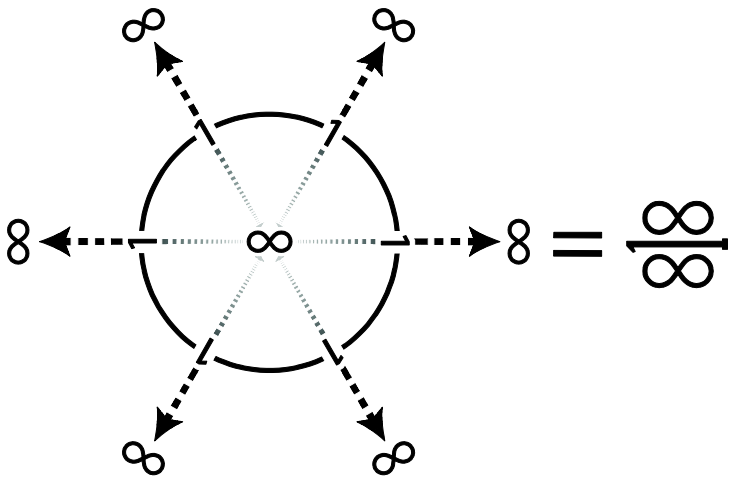
Leibniz says in his notes, "The second is that which is greatest in its own kind, as for example the greatest of all extended things is the whole of space, the greatest of all successives is eternity." These are the spatial and temporal (extension and duration) *aspects* of The Infinite, respectively. Spinoza distinguishes this type of infinity as, "that which has no limits, not in virtue of its essence, but in virtue of its cause..." All abstracted aspects or properties of The Infinite are in this sense also boundless because they apply to, or are abstracted from, the Absolute Infinite. So each aspect of The Infinite is infinite or boundless in extent and ultimate amount, not due to its own "essence"—which is an Empty, finite and relative category or abstraction—but because each draws its indwelling *cause,* or is *abstracted from*, the Infinite, ineffable source, or true univocal and nondual essence of the absolute. This very common type of infinity will be broken into sub-levels for further clarification.

Perhaps because of the effectiveness of mathematical examples for this type of infinity, Pruss calls it the "Mathematical Infinity." However, this term leaves out the whole class of aspects of The Infinite outside the realm of mathematics. Furthermore it would seem to exclude the mathematical aspects of the third order of infinity (introduced in a few pages below), and this flies in the face of Spinoza's own "geometrical example" of the third order, as we will see.[i] Given this, we will loosely side with Cantor and choose not to categorize the 2nd order as the Mathematical, but as the Aspect Infinite.

First and Second Phases of the Aspect Infinite

Recall our Cycle of Unity (p255) with the immanent-transcendent omni-axis beginning as the first pre-mathematical aspect abstracted from Infinite Unity in the ONE, through the ALL of infinite multiplicity and its ONE-one relative uni-axis represented by the VLE ∞ / ∞, whose solidus/vinculum is the boundary of the finite unity and primitive unit-number 'one' and whose pre-differentiated, pre-mathematical, vision-logic level ratio-equality brings us back to the ALL as ONE. See the figures repeated below.

[i] This is likely due to the transcendent-bias in only recognizing transcendent forms of infinity in modern mathematics, and seeing the immanent infinite as merely the undefined or the indefinite.



$$\text{ONE} = \text{ALL} = \frac{\infty}{\infty} = \text{ONE}$$

Figure 15 and Figure 16 repeated from *The (Binary) Cycle of Unity*, p255

In The Cycle of Unity, recall, we move from the outer-reaches of the orbit, the *apoapsis*[i] of the pre-quantitative Infinite Unity of the ONE, through the "quantitative aspect" in the infinite multiplicity of the ALL, to the recognition of "immanence in transcendence"[ii]* in the pre-mathematical division or interface of the immanent-transcendent uni-axis and its implicit singularity into the first boundary and primitive number needed for mathematical operations.

The second degree of infinity, the Aspect Infinite, arises with the first (EOTC), pre-quantitative "multiplication through division" of The Infinite ALL-is-ONE into the first polarity of the immanent and transcendent *aspects* in the omni-axis. In this process we move from the sub-representational and ineffable ONE to the quantitative, yet pre-mathematical *aspect* of multiplicity and its inherent omni-non-directional, omni-non-local relativity in the ALL. From there we move to the omni-directional/locational aspects of the ONE-one uni-axis and then to the selection/derivation of our unit-scale interface and finite unity for the beginning of primitive mathematical operations—namely counting to create the first agglomerative and transitive "natural"

[i] "(*astronomy*) The point in an orbit farthest from the center of attraction." Answers.com

[ii]* See *Principle 3: Chord 2: The Principle of* Immanence in Transcendence, p95.

numbers, each one of which is an enfolded infinity—a primitive infinite number—given that each is composed of finite unity which enfolds infinity within itself. It is this implicit infinity which is broken open with the Rational numbers and fully with the "irrational" or transrational numbers.[i]*

In this way, as we will see more clearly in *The Holarchical Unfolding of Number and Operation* (p307), the immanent-transcendent omni-axis can be considered a first phase in the embryogenesis of the concept *within* the 2nd order infinity of the Aspect Infinite, since, unlike other aspect infinities, it maps directly to the first polarity of the ONE-ALL and it is the first aspect abstracted from The Infinite in The Cycle of Unity and the holarchical embryogenesis of number and operation. The pre-differentiated I/T omni-axis, recall, is both omni-directional and omni-local, thus possibly representationally enfolding and unfolding, and providing a space, for all other directional and positional aspects of The Infinite in Interface Mathematics.

In this embryogenesis, the omni-axis is thus *prior to* the operations and quantitative functions (including number itself) of mathematics. It is not derived *a posteriori* from any function of number, such as the set-generators which unfold the higher functions/relations of number and its transfinite orders of infinite sets, but is *prior to*, and, in this sense, *independent of* number. In this way, as representing both The Infinite and Cantor's Absolute Infinite (1st order) it is also prior to, and independent of, all of Cantor's transfinite orders which, as we will see, work their way up into function in the holarchical unfolding of mathematics itself.

Note that the omni-non-dimensional I/T omni-axis is also prior to any concept of dimensionality whatsoever, such as the transitive notions of "flat" or "curved" Cartesian/Euclidean or non-Euclidean space. It is only represented visually in terms of straight lines for the sake of simplicity. Note as well that the concept of curved-space has no meaning without the identical opposite notion of flat space as a context (nor vice versa, straightness without curvature). In this nondual sense, one cannot be prior to the other, and hence the immanent-transcendent omni-axis is neither/and (non-omni) flat or curved. See *Boundary and Dimension* (p296) for more information.

All representations of The Infinite are necessarily aspect infinities—even the first-phase aspect infinity, the I/T omni-axis—as they draw their infinite nature as *representational aspects* from The Infinite. Other aspects include what we could call the second-phase aspects, e.g. the transitive number-line when counting by ones, twos, fours, eights, or recursively self-multiplying into perfect-squares, dividing into the immanent continuity of the rationals, etc. The abstracted aspects of The Infinite, in these cases would be "square-

[i]* See, The Holarchical Unfolding of Number and Operation, p306.

ness," "even-ness," "point-ness," "line-ness," "plane-ness," or "volume-ness" (extension), etc.

Imagine instead of *drawing* an infinite line (a clear impossibility) that the infinite line is simply *abstracted* into representational reality, bit by bit, from The Infinite, omni-dimensional continuity which initially contains the possibility of all lines. The *linear aspect* of The Infinite appears from the continuity because we put *emphasis* on it, and it disappears when we let it go. Once manifest, we can then assign to its intrinsic nondual or trans-rational continuity an arbitrary set of numbers based on whatever set-generating algorithm and relative to whatever transitive scale we choose (e.g. the mathematical ratio generating the set of the Rationals with their Dedekind cuts and intrinsic limits).

Other examples of second-phase aspect infinities include the transitive (directional) axes which unfold, and are enfolded within, the immanent-transcendent omni- and uni-axes. This would include all mathematical infinities, such as an infinite line, or Cartesian axes coupled into planes or grouped into volumes or "higher dimensional" and non-Euclidean multi- or agglomerative-dimensional representations. The second-phase category would also tentatively include every one of Cantor's infinite degrees of the "transfinite," as we will see.[i]*

The sense here is that these mental forms of set-generators, omni-/uni-directionality, "linearity," "planarity" and n-dimensionality are abstracted as singular or grouped directional/positional (relational) aspects from the concept or reality of the Absolute Infinite, but furthermore, the omni-axis enfolds and unfolds the uni- and directional- axes, and hence is a more primitive order in the embryogenesis of the concept of mathematical, ontological and epistemological infinity.

In this way, as Spinoza notes, we can already see "what kind, of infinite may … be conceived greater than another infinite, and what kind cannot be so conceived." The Absolute Infinite is inquantate,[ii] or "not one," as the non-dualists may put it, and thus (in accord with our Quantitative Principle of Infinite Unity (p246)) it can't be quantitatively operated upon to conceive of any greater infinity. The aspects of infinity, however, spring from, and as, the interface between The Infinite and the relative realm of representation and its finite forms and frames of reference, as abstracted aspects of "contingent" reality, as Cantor put it. Aspect infinities are thus "quantate" and comparable insofar as their representational aspects and frames of reference are concerned.

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[i]* See, To Infinity and Beyond: Tuning and Triuning the Paradox, p432.

[ii] Or non-quantitative…

This is the key to reconciling (transcending-and-including, differentiating-and-integrating) the Galilean paradox as well as the Cantorian fix designed to neutralize it by the Pearl Principle of axiomatic encapsulation.[i]* In this sense, the infinity of the Galilean perfect-squares is derived as the aspect of squaring the wholes whose primitive infinity is derived from The Infinite as the unbounded or indefinite aspect of counting finite unities. In a similar way, the higher Cantorian orders of the transfinite are derived in "higher power," higher-level set-generating operations, or set-aspects. These emerge at higher levels in the holarchical embryogenesis of operation and number, such as at the level of powering and rooting with Dedekind's irrational "cuts" into the rational continuum, itself derived by the lower-level, or more primitive set-generating function of the mathematical ratio.[ii]*

Note that the sets and subsets of the number-line appear *to the imagination* as different orders of magnitude ('cardinalities' or the number of elements in a set), but the imagination itself is a relative and finite or indefinite process, as already discussed above,[iii]* and as emphasized in Spinoza's *Letter XII*. For instance, recall Galileo's use of the imagination in showing the *apparent* difference in magnitude between the wholes and perfect-squares as visualized for any finite line segment. This idea of different magnitudes of infinities violates the simple (recall the paradox of Hilbert's Hotel), undifferentiated or "naive" concept of infinity as that which is boundless and unsurpassable.

The resolution to this paradox is to realize that none of these infinite number sets can have an ultimate number of items (a 'cardinality,' in the familiar, imaginable sense of a finite set) because with every value there are always larger and larger values attainable and thus all these sets are fundamentally boundless and infinite. Each infinite-set draws its boundlessness from The Infinite itself and always in reference to a transitive scale—e.g. at the "aleph-null" level, that of "countability" or the "one-to-one" relationship to the numberline.

In an infinite set, cardinality has a critically different meaning than in a finite set. It does not denote the *number* of elements, because an infinite set has no definite, final or actual number[iv] of elements. It denotes, rather, a relation between generative "powers" of set-generation algorithms, as comparable through the one-to-one correspondence seen with the Galilean

[i]* See The Pearl Principle, p235

[ii]* We'll explore this in much greater depth in, The Holarchical Unfolding of Number and Operation, p306.

[iii]* See, Spinoza, the Infinite, the Indefinite and the Imagination, p264.

[iv] According to the definition of number as boundary, at least.

paradox and vindicated through (the controversial) Hume's Principle.[i] In this simple way we can compare the *degrees* to which these set-aspects abstract similar or different "powers" of infinity (our quantitative aspect of the absolute scope) from The Infinite, unbounded Emptiness, Cantor's Absolute Infinite or Spinoza's God/Substance with infinite attributes.

Order 3: The Modal (or Bounded) Infinite:

The Bounded Infinite is the third and lowest order of infinity as it deals with the unbounded *within* the bounded. Leibniz says in his notes, "The lowest is, for the sake of an example, like that of the asymptote of a hyperbola; and this I usually call the mere infinite." Spinoza describes it as, "…that, of which the parts cannot be equaled or expressed by any number, though the greatest and least magnitude of the whole may be known..." Spinoza provides for this degree of the infinite, his famous geometrical example. Spinoza says [my ***emphases***]:

> As, for instance, in the case of two circles, non-concentric, whereof one encloses the other, no number can express the inequalities of distance which exist ***between*** the two circles... This conclusion is not based on the excessive size of the intervening space. However small a portion of it we take, the inequalities of this small portion will surpass all numerical expression. Nor, again, is the conclusion based on the fact, as in other cases, that we do not know the maximum and the minimum of the said space. It springs simply from the fact, that the nature of the space ***between*** two non-concentric circles cannot be expressed in number. Therefore, he who would assign a numerical equivalent for the inequalities in question, would be bound, at the same time, to bring about that a circle should not be a circle.

The modal infinity is a 2nd order derivative from the Absolute Infinite, and it unfolds from the confluence of the two main aspect infinities: the I/T (omnidirectional) and the transitive (uni-directional) derived from our finite unity as a frame of reference. The modal infinity is the interface between the immanent and transitive aspects or directionalities, and can thus be seen as a subset of the 2nd order—as it reaches from the apoapsis of the ALL-ONE and onto the ONE-one of the I/T uni-axis, passing the periapsis of the finite unity, to the implicit singularity at its core. On the transitive axis which sees a line segment or circle as explicitly bounded there is indeed a discernable outside limit but this limit is not contained within the specified system of immanent division, which has no conceivable end in sight, so no conceivable ultimate number can be found for the inner limit. The limits themselves, being "infinitely precise, are infinitely indefinable. This echoes our Principle

[i] Wikipedia: Hume's Principle: "…the number of Fs is equal to the number of Gs if there is a one-to-one correspondence (a bijection) between the Fs and the Gs."

of Infinite Determinism, recall, where infinite determinism equals fundamental (unbounded) indeterminism and the inability to ever encapsulate the immanent causation into a finite and absolute explanation or prediction.

As Bucky Fuller says in his *Synergetics*:

> The only infinity humanity has discovered experimentally is that of the whole-fraction subdivisibility of wholes into parts, as for instance by the progressive halvings that divide the finitely closed circle into ever smaller, central-angle-expressed, arc increments (1001.15).

This is the bounded infinite, but these processes themselves are not infinite. They are indefinite. And the same indefinite—as the interface between the finite and The Infinite—has been discovered in our operations on the aspect infinities of the number-line or of unbounded space. We have found only unbounded dimensions, because beyond every boundary we have always found more dimension, where we are capable of finding anything at all. Indeed, a boundary cannot even be found until it is surpassed, exposing the fundamental polarity of the infinite and finite.

The modal infinite is the order of the fractal, complexity theory and nonlinear and/or recursive functions, and it is also the home of our familiar oxymoron, "finite but unbounded," and our primitive (finite) number as an enfolded or encapsulated infinite number, in an identity of opposites. Due to the symmetrical circularity (inverse tautology) of the phrase "finite but unbounded" it easily could be stated in the reverse, "infinite but bounded" because what it really means (given our necessary remapping of finite and infinite to bounded and boundless respectively) is "infinite yet finite" or "bounded yet unbounded." The problem here is that the scientists are not aware of the two aspects of directionality pre-fused and conflated (con-fused) in the one Infinity. They thus quite easily and unknowingly mix them together.

The modal infinity, as the interface between the immanent and transitive directionalities, starts from the transitive and divides inwardly along the immanent axis. Every successive division is a transitive measure (distance) toward a deceptively simple "Euclidean point" and implicit singularity of an immanent/transcendent uni-axis. The modal infinite involves procedures, such as those of the hyperbola and the infinite continuity in the definition of the circle or even the line, whereby an explicit number cannot be given for a quantity, but it is not excluded that a lower and upper transitive bound can be given. This is because on the transitive axis there is indeed a discernable outside limit but this limit is not contained within the specified operations of immanent division and its access to the aspect of infinite continuity in The Infinite. The ideal mathematical procedure divides the distance between the inner and outer limits indefinitely with no conceivable end in sight, so no conceivable ultimate number can be found for the inner limit. It fails to see

that the "infinite smallness," (immanent zero, or the "ideal-point") which must characterize this distance is not a distance at all. Distance cannot be cut finally into non-distance. The limit of the immanent axis cannot be reached because it is the infinite and unlimited itself.

This example, however, is a mathematically ideal, virtual and indefinite process—the process of quantifying the continuum. The continuum does not intrinsically have an infinite number of parts; it has no parts. It is a pre-differentiated abstraction. As a pattern or modification it can be divided (or folded, as Deleuze might say, channeling Leibniz) symbolically in the mind or physically and mechanically an indefinite number of times. This is why Pruss calls this infinity "Indefiniteness" because it stems from a process in space and time which can have no final ideal end. Leibniz calls this kind of infinity the "mere infinite" as a main feature of his "labyrinth of the continuum."

Given that human beings are themselves finite unities, it is the modal infinite with which he has the most contact. Everywhere man looks he finds the boundlessness of the indefinite, the interface between The Infinite (both within and without him) and the finite.

The Platonic Sphere as Root Modal Infinite and Primitive Infinite Number

It is certainly no coincidence that Spinoza used the example of the circle, the cross-section of the sphere, in his explanation of the modal infinite. The sphere itself is the simplest and root-level bounded infinite and infinite number as the interface of the ONE-one uni-axis and the abstracted *aspect* of infinite omni-symmetrical boundedness itself, from the boundlessness within itself.

Fuller says in his Synergetics, "The Greeks defined the sphere as a surface outwardly equidistant in all directions from a point. As defined, the Greek sphere's surface was an absolute continuum, subdividing all the Universe outside it from all the Universe inside it; wherefore, the Universe outside could be dispensed with and the interior eternally conserved" (224.07). This is why he called the mathematical sphere a perpetual motion machine. Energy can't get out or in through an infinitely continuous boundary. And this is of course exactly the boundary cannot exist, in the sense that stasis cannot exist and persist without continual flux.

The sphere—in this absolute sense of bounded continuity—is the closest possible EOTC representation of the omni-*non*-symmetry of the *ONE*, in the *omni*-symmetry of the *one*. This is why the ancients intuitively held such a vaunted place for the sphere, and rightly so. It is the interface of the ONE

and the one,[i] the abstracted essence of man himself in his relation to the immanence and transcendence of God.

The Fractal

A subset of the Modal Infinite which deserves explicit exploration—vividly fleshing out the percepts behind this concept—is the ubiquitous fractal. The fractal is known for its infinite depth of immanent detail. Its "quasi-continuity" of form in the face of the Emptiness of its infinite depth. At the heart of the fractal, among many other areas of mathematics, is recursion or iteration. A fractal equation is deceptively simple. The root equation for both the Mandelbrot and the Julia sets, for example is: $Z = Z^2 + C$. Iterating the equation indefinitely for every constant C and feeding that result back into Z, the results are plotted on the "complex plane" and manifest as an infinitely complex surface such as the following type of unearthly beauty, now so familiar to mathematicians, artists, scientists and laymen alike:

[i] See, I/T Interfaces, the Omni-Uni and the Omni-Non, p146.

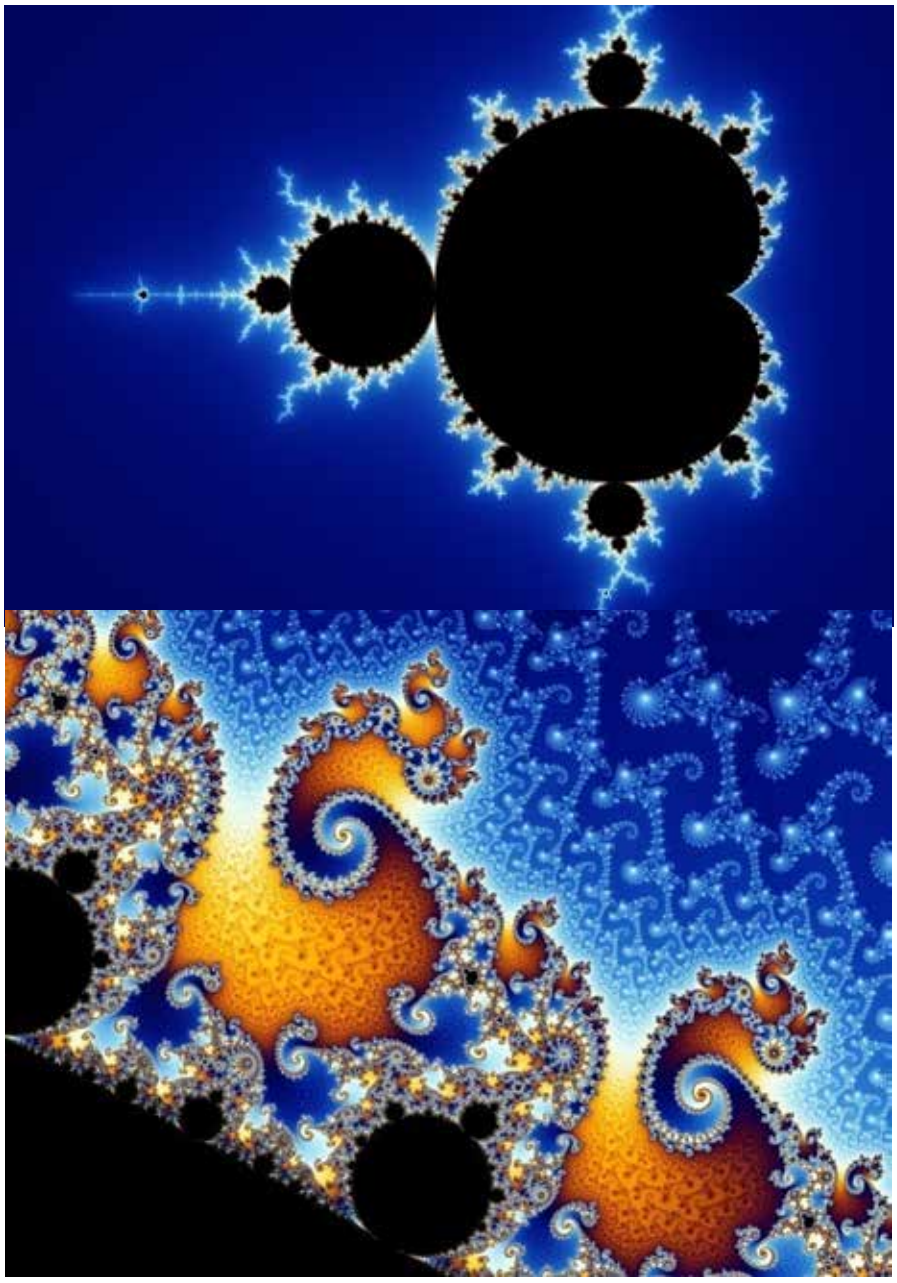

Figure 19: Mandelbrot Fractals:
Top: The whole bounded Mandelbrot set. Bottom: A zoomed-in section (the boundaries of which are too small to see) of the Mandelbrot set, showing a deep section of the infinite detail of the "surface." (source: Wikipedia commons)

Another illustrative aspect of fractal mathematics is the famous paradox of the "infinite coastline." Like the Mandelbrot set, the infinite coastline has infinite detail in its bounded "surface" structure. We can arbitrarily choose to measure this coastline, and its infinite depth, by any scale we decree. This is our familiar implicit selection of a finite unity or interface on the ONE-one singularity of any immanent-transcendent uni-axis. It is the intersection of the immanent and transitive aspects of The Infinite. The smaller and smaller the scale (transitive finite unit or unity) we choose to measure with, the more and more detail and distance is exposed to our measurement. And so every time we measure it at a smaller scale, our coastline gets larger and larger. Given that our axis of scale (the immanent-transcendent axis) is unlimited, so also is the actual length of our coastline. See Figure 20, below.

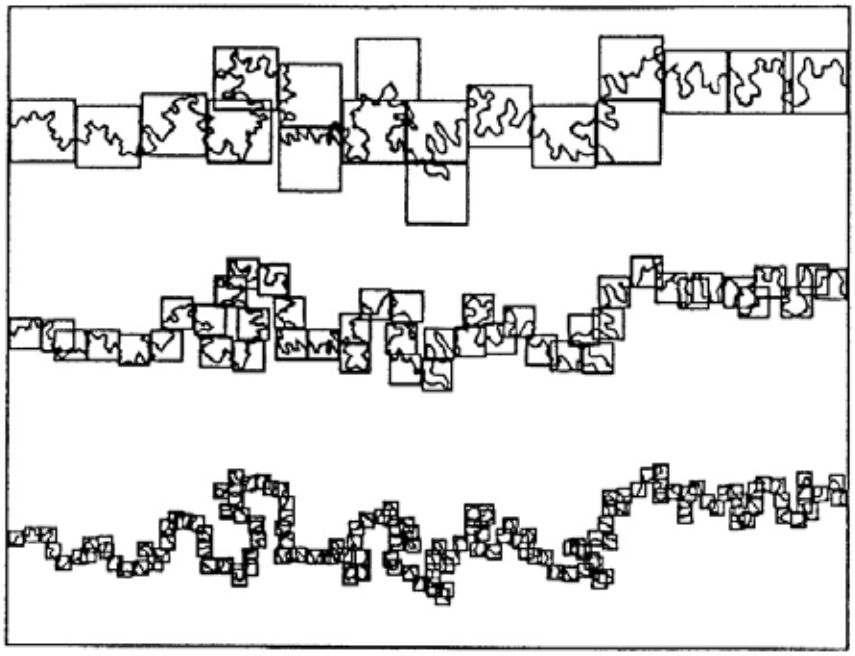

Figure 20: The Infinite Coastline:
Copied from Fractals and Education: Helping Liberal Arts Students to See Science by Michael Frame, in Fractal Horizons by Clifford A. Pickover

The Triune Infinite and the Triad of Substance, Attributes and Modifications

Recall Spinoza's definition of the finite; "A thing is called finite after its kind, when it can be limited by another thing of the same nature; for instance, a body is called finite because we always conceive another greater body." As should be clear, we can also take Spinoza's definition of The Infinite and finite generally in terms of the polarity of Substance and its Modifications, respectively, and its Cycle of Unity[i]*, within which Substance turns around its modes and vice versa. That which is modified is, in some sense, necessarily bounded and has magnitude (e.g. size, length width, duration) relative to other modifications; modification is necessarily in the relative realm of form in identical opposition to the absolute realm of Emptiness.

Spinoza also had infinite modes in his system, however, to which our aspect infinities correspond, as aspects at the interface of the finite and The Infinite. For example, the set of perfect-squares can be conceived as an infinite or unbounded modification of the mathematical continuum, yet Cantor discovered that this infinite has the exact same quantitative power (aleph null) as that of the wholes and the rationals, and is first surpassed only by the infinity of the irrationals. Thus the infinite modification is, *in this sense of the aspect of power*, finite and bounded, and this is precisely due to its being a modification, or participating in the world of form, identically-opposed to the world of Emptiness or The Infinite, from which it draws its boundless *aspect* in its power of set-generation.

Similarly, when we divide an infinite set or number-line into two parts, both could still be infinite without paradox, as codified in our quantitative principle of Infinite Unity.[ii]* The Aspect Infinite renders the paradox illusory in the sense that taking directions at the line of division is to take a *sub-aspect* of the infinite line. It is to take a sub-aspect of the polarity of the aspect of linearity, abstracted from The Infinite. Neither of the sections on either side of the division would be finite in their direction or "kind." Therefore, this division of the infinite does not produce limits in their own kind but draws out polarities and aspects, all of which share in the boundlessness of The Infinite from which they are abstracted.

[i]* See, The (Binary) Cycle of Unity.

[ii]* See, Principle 7: Chord 5: The Quantitative Principle of Infinite Unity, p245.

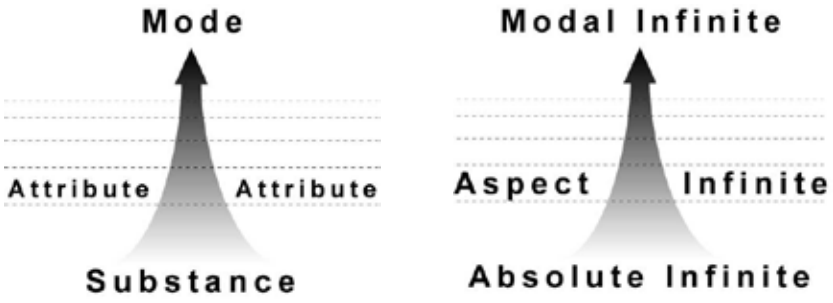

Figure 21: The Triune Infinite and the Triad of Substance, Attribute and Mode: In this diagram we can see the structural similarity between the mathematical ontological and triads in Spinoza: the Triune Infinite and the Triad of Substance, Attribute and Mode.

This relation is key to the structure of Spinoza's Ethics (See Figure 21, above). This polar identity of opposites of the finite and infinite is helpful in reconciling the relation between the mode and its infinite immanence derived as the finite unity from the ONE-one uni-axis and its implicit singularity. Take the following quote from Alain Badiou's *Spinoza's Closed Ontology*[iɣ] [[my comments ***emphases***]]:

> In the letter of March 1663 to Simon de Vries, Spinoza takes pains to declare that the word 'attribute' does not by itself constitute a naming of the 'there is' [[finite unity]] in any way essentially distinct from the naming of the latter by substance. Having reiterated the definition of substance he adds: 'I understand the same by attribute, except that ***it is called attribute in relation to (*respectu*) the intellect***, which attributes such and such a definite nature to substance. [[The attribute is only finite in the sense that it is in respect to the intellect. It is abstracted as a special kind of aspect of The Infinite.]] Thus the attribute, as well as the multiplicity of attributes through which divine infinity is ***identified***, is a function of the intellect. In the general arrangement of the 'there is', there exists—under the name 'God'—a singular localization [[implicit singularity, or aspect of locality, the 'one' of the ONE-one uni-axis]], that of the intellect, upon whose point of view or operations depends thought's capacity for rational access to divine infinity, and hence to the 'there is' as such.
>
> It is thus necessary to recognize that the intellect occupies the position of a fold—to take up the central concept in Deleuze's philosophy. Or, using my own terminology, that the intellect is an operation of torsion. It is localizable of an immanent production of God, but is also required to uphold the naming of the 'there is' as God [[abstracting the identifiable

[iɣ] (Donovan)

> aspects of/from The Infinite]]. For only the singular operations of the intellect give meaning to God's existential singularization [[ALL-ONE]] as *infinite* substance.

This infinite immanence and implicit singularity new to the rational—explored deeply by Leibniz as well, in both metaphysical and mathematical form (e.g. monads, the calculus and the labyrinth of the continuum)—is the positive infinity which Deleuze called the secret of the rational. In univocity, a mode unfolds from infinity, as infinity participates in its own bounded aspects in the infinite depth of its interfaces (recall the infinite coastline, above), and Substance turns around its modes, and its modes around Substance, as Emptiness is Form and Form Emptiness.

It would indeed be a fruitful exercise to undertake an analysis of Spinoza's *Ethics* from this "organizing principle" of the Infinite as the triune-interface of the "polarity of polarity" in the Univocity Framework.[i]* In this sense one could continue to tease out many of the problems of traditional Spinozist hermeneutics, such as the relation of modes to Substance, and both to the varied forms of infinity, and The Infinite absolute. One could see that indeed modes are not other than an interface of infinity, and so on. Some of this will unfold herein, but much of it will remain beyond the scope of this work.

[i]* See, Polarity and Univocity, p174.

VCS META-TAGS: SCOPE PARAMETERS AND VISION-LOGIC EQUATIONS

As we have seen, the scope parameter is a linguistic device (similar to the use of scope in computer programming languages) for delineating and rendering explicit the otherwise implicit absolute and relative scopes. In the Vision-Logic Coordinate System, we can make the aspect of scope explicit for delineating the perspectival inhabitation (or absolutization) of the various axes, levels, positions and poles within the system, making inescapable the acknowledgement of each of their unique properties and limitations.

The scope parameter has two main divisions: the absolute (ab) and the relative (rel). From the vision-logic level, each of the triune levels of infinity[i]* can be descended into, or "inhabited," as different levels, or abstracted aspects of an absolute scope; delineated as *ab1*, *ab2*, and *ab3*, for the 1st through 3rd degrees of infinity, respectively. The scope for ab1, however—due to its inclusive identity of opposites in the fundamental polarity represented by the ONE-ALL and its immanent-transcendent omni-axis—generates a binary subset of scope parameters; the "charged" (unbalanced) scopes of the I and the T (the immanent and transcendent) taken independently and denoted with a + or – sign as a *suffix*. For example $\infty -$ would denote the immanent pole, or aspect, and $\infty +$ the transcendent.

This use of charge in the suffixes above is opposed to the use of prefixes in the transitive polarity, denoting negative and positive transitive infinities ($-\infty$ and $+\infty$), such as the positive vs. the negative integers. The suffixes used in the I/T scope parameters denote the *a priori* neutrality or (intensive, rather than oppositional forces) of the positive infinity of the immanent-transcendent axis. Furthermore, they encode the transcendent-bias *a posteriori*, as transcended-and-included transitive suffixes, from which the *a priori* I/T polarity is viewed. Again, this is because, as we will see, in the holarchical unfolding of the operations of mathematics, (called the Onion of Operations, herein) the positivity and negativity of the transitive axis is transcended-and-included into the immanent-transcendent axis via the functions of the mathematical ratio and the rational numbers, which have no intrinsic positivity and negativity of their own. Taking the immanent as essentially the "negative view" of the I/T axis, with its negative *a posteriori* suffix charge, is an acknowledgement of the necessity of the transcendent-

[i]* See Spinoza's Triune Infinite, p270, above.

bias, as it is encoded also, only this time consciously, into the very structure of the VCS meta-tags.

Since the scope for the uncountable I/T axis itself, the ab1 scope, includes both poles, it will be considered "neutral" (intensive) and each of the two poles taken separately will be considered "charged." However, since this isolation of one pole of the axis at the expense of the other can only occur through an interface—i.e. the interaction between the ONE-one of the I/T uni-axis, its implicit singularity and the finite unity of the transitive axes—(as the discussion on the Bounded Infinite[i]* and The Cycle of Unity[ii]* suggests) this "charging" or "unbalancing" of the 1st level brings us down to the 3rd level of the modal infinite and the finite unity, in a full-circle, linking the top with the bottom through the interacting core aspects (see The Cycle of the Infinite (p294) below and The Cycle of Unity (p255), above).

The scope of the isolated or emphasized immanent pole will therefore be given the negative[iii] suffix and the scope for the transcendent pole, the positive. So we now have the ab3+ and ab3- scopes for the transcendent and immanent scopes respectively, and we can introduce this "charge" into the VLEs themselves to denote the imbalance between the immanent(-) and transcendent(+) aspects of the Infinite.

Furthermore, each of the infinities and scopes also has an accompanying vision-logic equation (VLE), which is a logical, or relational equation for dealing with the quantitative aspects of the absolute/relative polarity (the polarity of polarity)[iv]* from a vision-logic level in the meta-mathematical framework. Since we are dealing *with* the absolute scope, and therefore necessarily with the philosophical and pre-mathematical, rather than the mathematical notions of infinity, and given that infinity in either case is not a number, these VLEs are not rigorously mathematical, but rather meta-mathematical, logical or relational, with their own peculiar logic.[v] They use the relational operators of mathematics to quickly and intuitively invoke the simple conceptual and logical relations between the levels and the VL-axes of the VCS. They are used more as metaphors, or maps, than quantitative derivations. This is largely because of their extensive use of infinity, and its inability to really partake in quantitative operations[vi]*—operating as the VLE often do between the relative and absolute scopes.

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[i]* See, Spinoza's Triune Infinite, p270, above.

[ii]* See, The (Binary) Cycle of Unity, p254.

[iii] …due to the transcendent bias statistically emergent and empirically demonstrated in human thought.

[iv]* See, The Univocity Framework (UF), p153.

[v] The subject of operations on the infinite is already controversial for precisely this reason; Infinity is not a number.

[vi]* See, Principle 7: Chord 5: The Quantitative Principle of Infinite Unity, p245.

The Vision-Logic Equations

The Root VLE (I/T Axis and the Absolute Infinite)

The root-level VLE, and the VLE upon which the others are based, is the equation for the immanent/transcendent omni-axis, and thus for the Absolute Infinite (ab1) to which it maps.[i] It is as follows:

$$\frac{\infty}{\infty} = ONE$$

Equation 1: VLE: ab1 — The Infinite: The Root VLE[ii]

and expanding this equation we have…

$$ALL = \frac{transcendent}{immanent} = \frac{\infty}{\infty} = ONE$$

Equation 2: VLE: ab1 — Expanded Root Equation and VLE: Cycle of Unity

The transitive (uni-directional) axis is implicit (enfolded) in the concept of the omnidirectional I/T axis and is naturally represented in the root VLE by the solidus or vinculum,[iii] exfoliating from and separating the *transcendent* from the *immanent* omnidirectional aspects of the equation in the transitive plane of the solidus-interface of the omni-axis.[iv]*

[i] As would be expected; The lower levels of the infinite exfoliate from the first and this is echoed in the relations among the VLEs.

[ii] With the transcendent/transitive bias in modern thought this collapses to oo/0 where division by zero is correctly recognized as undefined, but the denominator is incorrectly recognized as 0 as opposed to the immanent pole of deep infinity (I/T) denoted as oo-.

[iii] Note that division/multiplication is always the operator in these equations. This is because the ratio is the core of Rationalism and multiplication and division are the two poles of the mediating operator (cultivated third) between the I/T (powering/rooting) and transitive (arithmetical) axes in the "Onion of Operations" in, Part Two: Interface Mathematics, p200.

[iv]* See, I/T Interfaces, the Omni-Uni and the Omni-Non, p146.

The 2nd Order VLE (Aspect Infinite)

The 2nd order *mathematical* equations are many and varied, such as the "set-aspects" or set generators of infinite sets and any other equation that projects, or abstracts finite patterns or aspects from or onto The Absolute Infinite. Aspect-level VLEs, however, are any VLE that involves the infinite term with a finite operator. We'll use Ω as the universal operator to denote any possible *mathematical* operation. The defining ab2: VLE is:

$$(n\Omega\infty)=\infty$$

Equation 3: VLE: ab2 — The Aspect Infinite

Recall that prior to this point we were calling the root VLE the equation of Infinite Unity,[i]* and that it denoted both the I/T omni- and uni- axes. Now that we have delineated the *a posteriori* charge of the immanent and transcendent operations as they transcend-and-include the transitive,[ii] we can also differentiate the uni- from the omni-axis in terms of the VLE, placing the uni-axis in the aspect level as touching the relative scope in its finite and singular aspect of position or locality in its implicit singularity. The VLE for the I/T uni-axis is as follows:

$$\frac{\infty+}{\infty-}=\infty$$

Equation 4: VLE: ab2.1 — The Uni-Axis with Interface at Finite (Bounded) Unity[iii]

The 3rd Order VLE (Bounded Infinite)

Due to the complexity of the interactions between the immanent and transitive axes, and the fact that the Bounded infinite brings the absolute down fully to the relative level where mathematics (the art and science of pure relation) thrives, *mathematical* equations for the Bounded Infinite

---

[i]* See, Infinite Unity: ALL is ONE, p240.

[ii] We'll explore this in much greater depth in, The Holarchical Unfolding of Number and Operation, p306, but very simply, the first numbers are the wholes and they form the first transitive numberline. From there we move to the positive and negative transitive charge of the integers and it is not till the Rationals that we break again into the intensive forces of immanence and transcendence, transcending-and-including the transitive oppositional charge of the integers.

[iii] The ONE-one of the uni-axis, recall, is the transition between the absolute scope of omni-non locality and the one locality of its implicit singularity, or immanent position aspect. Therefore, we place this VLE exactly half-way between the

come in multifarious well-known forms. These include the asymptote of a hyperbola, as Leibniz noted, as well as many fractals. The *VLE* we will use herein, however, is also found in Deleuze's *The Fold: Leibniz and the Baroque*. In our terms, it represents the bounded infinite with an "external limit," at (finite) unity or one (we will see why this is important a bit later in the section on Spinoza and Leibniz as an identity of opposites). Since the triune infinity is a nested hierarchy, and the Bounded Infinite is a subset of the aspect infinite, the 3rd order equation is merely a special-case, or recursive, 2nd order equation because it "involves the infinite term with a finite modifier" and specifically it involves the interface between the two main aspect infinities of the I/T and the transitive; In this case the VLE represents the isolated immanent pole of the I/T axis due to this recursive interface. The VLE for the Bounded Infinite with an external limit at unity (the unlimit is in the immanent direction) is identical to the VLE for the charged -ab3 scope, the isolated immanent pole of the I/T axis, and it can be written as:

$$\frac{1}{\infty} = \infty -$$

Equation 5: VLE: ab3- — The Bounded-Immanent Infinite

And for balance, we'll give the reciprocal VLE for the transcendent pole, the Bounded Infinite with an *internal* limit at unity, the VLE for the charged ab3+ scope. Note that what is traditionally conceived as the unbounded is actually bounded in the immanent direction. Thus the transcendent infinite, like the immanent infinite is bounded and unbalanced, or charged, with a positive or negative sign in the posterior position, denoting charge as intensity rather than as transitive opposition.

$$\frac{\infty}{1} = \infty +$$

Equation 6: VLE: ab3+ — Transcendent Infinite

Summary List of VLE

For reference and summary, here is the list of the VLEs at their respective levels of the Triune Infinite:

1: $\frac{\infty}{\infty} = ONE$

2: $(n \, \Omega \, \infty) = \infty$

3: $\frac{1}{\infty} = \infty -$ and $\frac{\infty}{1} = \infty +$

Note: The Cycle of the Infinite

As the levels move down the triune hierarchy, from the absolute through the relative scope aspects, they get progressively more and more relative (as aspects) and finite (bounded), since this triunity represents the cultivated third, or the interface, between the infinite and the finite. This also corresponds to the move from the trans-trans-bias in the *unrecognition* of the rational zero (undefined zero in the denominator) to the recognition, in the 17th century rationalists, of immanence in the bounded infinite.

The I/T omni-axis is only relative in that, as a vision-logic interface, it relates to, abstracts, and represents (or points outside itself to), the deeper quantitative, or "pure-relational" aspect of the ineffable Infinite, with its fundamental polarity in the ALL-ONE. The Aspect level, on the other hand, is injected with a finite (relative) operator *n* (denoting a finite frame of reference). As we have seen in the Cycle of Unity, however, the bounded infinity is the interface between the transitive (relative) uni-directional axes and the Immanent/Transcendent axis. The transcendent—ONE—of the final bounded infinite then merges through the Cycle of Unity back into the ALL, completing the Cycle of Infinity.

Though it contains an infinity within itself (and without itself), this bounded infinite with its implicit singularity can act (and must act) as a finite transitive root-unit and interact *relative* to other units. This nucleation is indeed how the transitive axes exfoliate (emerge) from the immanence and transcendence of the absolute, though we can clearly see here the necessary cyclical nature of this non-dual and non-foundational framework rooted in the rootlessness and implicit singularity represented by the uncountable I/T axis.[i]* The Cycle of the Infinite is the move from *a priori* I/T omni-non-local/-directional boundlessness, to the uni-axis, its implicit singularity and finite unit-interface, and through the holarchical unfolding of number and operation back to function on the I/T axis, making explicit its

[i]* This cycle is explored in greater detail in a related aspect called the "Cycle of Identities," (see The Binary Cycle of Identities, Axes and Unities, p381) and it is seen in the physical aspect of the model as well, called Sorce Theory.

implicit roots in immanence and transcendence. We'll see this in another form in *The Binary Cycle of Identities, Axes and Unities* (p381). As we will see, this bounded infinite is the abstract vision-logic description of the Leibnizian "monad" and the Spinozan "simplest body,"[i] the joint metaphysical and meta-mathematical union of the absolute and the relative; the infinite and the finite. It is also the previously unacknowledged beginning place of mathematics itself, as it codifies the origin of the number 1 as an implicit infinite number, enfolded into the primitive natural numbers, whose implicit infinity will not be broken open until the Rational numbers and fully with the immanent infinities of the "irrational" numbers.

[i] …a specific form of holon, "corpuscle" or anatom whose harmonic maximization of its own implicit singularity and infinite complexity culminates in extreme self-stabilization, self-focusing integrity and inertia. See, Trip-Reset: "Simplest Bodies" and the Self-Similar Kosmos, p586.

BOUNDARY AND DIMENSION:

> *Now the Greek word for measure, from which we get "metric," "meter," comes from the Sanskrit root "matr," which also means "to measure," and derived from that is the Sanskrit word "Maya," which means "illusion," as well as "imagination." So "figuring it out" is the measuring of the world—the metering. And "meter" also is the Greek word for "mother" and is of course the root of the word "matter," "material." And so when we ask, "Does it matter?" we are asking "Does it measure up to anything?"*
>
> — Alan Watts, *Who is it that knows there is no ego?*

In Interface Mathematics we are not offering an alternative dimensioning system in its own right, but instead are presenting a new way to view the standard dimensional model, using examples from various sources as useful to understanding dimension and its systems in themselves. Interface Mathematics can, in this sense, be seen naturally as an *interface* for understanding the inter-relations between these dimensioning systems. It is a "meta-dimensional" or meta-paradigm model for understanding the relation between dimensioning systems at a more general level. As such, a sub goal herein is to provide a direct interface between the standard rectilinear XYZ dimensional model and Fuller's radial, experiential and equi-economical vectorial Synergetic Geometry. We will do this without getting much into its details, and mainly touching only the branching point at its first dimension; our finite unity and primitive (infinite) number 1—the origin of counting and mathematical operation itself, as we will see.

Dimension from the Omni-Non

As we have seen, beyond the finite representationality of dimensioning systems, there is real, finite and infinite, sub-representational, *a priori* volumetric extension and it is only quantified (differentiated-and-integrated in the embryogenesis of the concept) *a posteriori* with the use of dimensions and systems thereof. Space, conceived as pure volumetric extension prior to experience, accommodates all possible dimensioning systems (their value is a function of their utility) and thus if it must be called "-dimensional" then it is "omni-dimensional." And by the principle of absolute reversal and the

identity of opposites, the omni-dimensional is simultaneously "non-dimensional,"[i]* because it hasn't yet been differentiated into dimensions.

Mathematics or geometry—conceived as a symbolic or syntactic rule-based approximation of volumetric, omni-non-dimensional extension—must function through simplification into the bare minimum of dimensions (a "breaking of symmetry") required to mathematically (syntactically/algorithmically) accommodate certain preconceived mental tasks, e.g. the coordination of abstracted positions, or the interrelation, comparison and contrast of different lengths and depths—or as Bucky would have it, for the task of finding the coordinate system that most closely represents the *structural* relations in nature, these being based in the radial and non-parallel functions of sphere-packing and omni-economical, omni-triangulating systems.

Any number of dimensioning systems are possible, depending only, perhaps, on utility as a fitness-function. And each one can have a completely different method of dimensioning and indeed a different number (and definition) of dimensions themselves.[ii] When, or *if*, we ever finally settle down on a single "all-encompassing" dimensioning system for fundamental physics and the physical sciences[iii] then we will still only know what it takes for the human mind to dimensionally or parametrically *interface* with our current observations and conceptions of reality as required by the current system of physics and its technological utilization. The math (and the interpretations of it) will always be that mental *interface* BETWEEN man and "God" (the one and the ONE) manifest in the relations of the sensible Universe.

Rectilinear vs. "Nuclear" Dimensioning Systems

Buckminster Fuller famously reasoned that the standard XYZ rectilinear Euclidean/Cartesian coordinate system was a remnant of "flat-earth thinking"—our transitive as opposed to Immanent/Transcendent axis, with its spherical coordinates. As Amy Edmonson says, "Early man, finding himself on a huge flat expanse, assumed that up-and-down and back-and-forth were the fundamental directions of his universe. Ninety degrees was the obvious natural angle with which to segment and measure space" (70-3). As soon as we escape the up-down-left-right perpendicularity of the local view of the spherical surface of the earth, however—with its mountains and plains of countless invisible *spherical* atoms—we find that Universe is

[i]* Recall, The Omni-Non: The Binary Logic of the Absolute/Relative Interface, p120.

[ii] … as demonstrated so beautifully by Buckminster Fuller's radically different, exquisitely coherent and consistent *Synergetic Geometry*, based on the 4 *spatial* dimensions inherent in the *a priori volumetric* tetrahedron-octahedron isometric vector relation.

[iii] Synergetic Geometry seems a good candidate … eventually.

inherently spheroidal and nuclear, not rectilinear. In every direction we look; inward, outward, sideways and backward, we find new levels of nuclear, spheroidal and radial structuring; from the algorithmic spacing of the atmospheric shells of the Earth,[i] to its core, its atoms, its moon, the planets, the stars, to the galaxies and their super-clustered hierarchies and on to the voids. None of these are rectilinear or square. Squares, or cubes are only found in certain crystals, and even then, far less often then the hexagon, and tetrahedron. Edmonson continues:

> Humankind has had more and more evidence of nature's radial and spherical bias throughout history—from the discovery of the shape of planets to the behavior of radiation and cellular growth. But neither Copernicus's spherical earth nor the vast array of biological and physical phenomena, all suggesting that angles other than ninety degrees would provide more "natural" or convenient standards, succeeded in reorienting the perpendicular bias of mathematics.

With its forces of attraction and repulsion, both contracting and expanding or radiating, the observed universe is far more radial and spherical than parallel and rectilinear. In fact, rectilinear structuring seems to be a subset of spherical and radial geometry at its boundary conditions such as the seeming flatness of the earth we evolved on and from which we began numbering the cosmos. Because of this, Fuller systematically configured planar trigonometry as a special-case of spherical trigonometry, in his 4-dimensional *spatial* geometry, based on the four axes of the four omni-symmetrical faces of the tetrahedron as minimal "system" in Universe. Fuller says in *Synergetics*:

> Synergetics is a priori nuclear; it begins at the center, the center of the always centrally observing observer. The centrally observing observer asks progressively, "What goes on around here?" (963.13) … In synergetics, all experience is identified as, a priori, unalterably four-dimensional. We do not have to explain how Universe began converting chaos to a "building block" and there from simplex to complex.[ii] In synergetics Universe is eternal. Universe is a complex of omni-interaccommodative principles. Universe is *a priori* orderly and complexedly integral. We do not need imaginary, nonexistent, inconceivable points, lines, and planes, out of which non-sensible nothingness to inventively build reality. Reality is a priori Universe. What we speak of geometrically as having been vaguely identified in early experience as "specks" or dots or points has no reality. A point in synergetics is a tetrahedron in its vector-equilibrium, zero-volume state,

[i] see Bode's Law and Sorce Theory.

[ii] It must be noted that this is in full agreement with the embryogenesis of the concept, in the sense that Universe is not the same thing as concept. Universe itself is eternal, but the concept-systems of man indeed do evolve "from simplex to complex," and this evolution of the concept, not the eternal (absolute scope: temporal-Emptiness) Universe, is what we are tracing herein.

> but too small for visible recognition of its conformation. A line is a tetrahedron of macro altitude and micro base. A plane is a tetrahedron of macro base and micro altitude. Points are real, conceptual, experienceable visually and mentally, as are lines and planes (966.12).

Fuller begins with the tetrahedron as the first modelable "system" in "Universe," because it is the minimum *polyhedron* which divides Universe into a *within* and a *without*. "System," for Fuller, is *a priori* volumetric and *structural* extension. The tetrahedron, however, is generated in Fuller's models (and in his "isotropic vector matrix," See Figure 22, below) from the relations in a set of four *spheres* of variable radius, or as points, if that radius is too small to be seen. And Fuller defines a point as *a priori* volumetric, a far-away or tiny "event-star." The tetrahedron, with its four event-stars, is the first geometry or structural relation to enclose a volume, because with any *three* stars we merely have the plane of a triangle. Add one more star and we have the tetrahedron, the first event configuration to divide a *within* from a *without*.

Note that with the four stars defined as the corners of a plane in the rectilinear XYZ model, *if* there is *any* misalignment whatsoever (and there always is such difference, perceptible or not, in *real*, "contingent" Universe) *then* we have a tetrahedron, not a plane. Three event-stars, however, can never define anything other than a plane; they can never warp into a volume, without the addition of that fourth event-star. The addition of that fourth star is the critical pure-relational step into "system" in Fuller's modelable and Operational Universe.

Thus the "axis" of "system" itself, in Fuller's synergetic geometry, is essentially our ONE-one ("unity is plural and at minimum two") I/T uni-axis differentiating the within from the without, with its interface as the omni-non-symmetric, minimally differentiated sphere. Fuller, however, fascinatingly sees the fundamental nature of the tetrahedron, and the 720-degree sum of its angles, in the sphere itself, with his observation that the operation of closing of any system, from the state of an unfolded plane into that of a volumetric boundary, involves this same "720 degrees of angular take-out." In other words, any system (volumetrically bounded form), from the skin of an animal to a sphere, can only become closed—from a flat plane to any volumetric boundary—by removing exactly 720 degrees, those found in the sums of the angles of the vectors of the tetrahedron, as minimum system in Universe. This exact angular quantity, for example, is found in the sum of the angles of the cuts that the taxidermist must make in flattening out the pelt of an animal from its bounded form to one suitable for a rug on your living-room floor. Unpeel an orange and the exact amount of "angular take-out" will equal 720 degrees, says Bucky. The sphere itself, as a closed system, is thus fundamentally a tetrahedron (or vice versa), in this sense of its intrinsic 720 degree angular take-out.

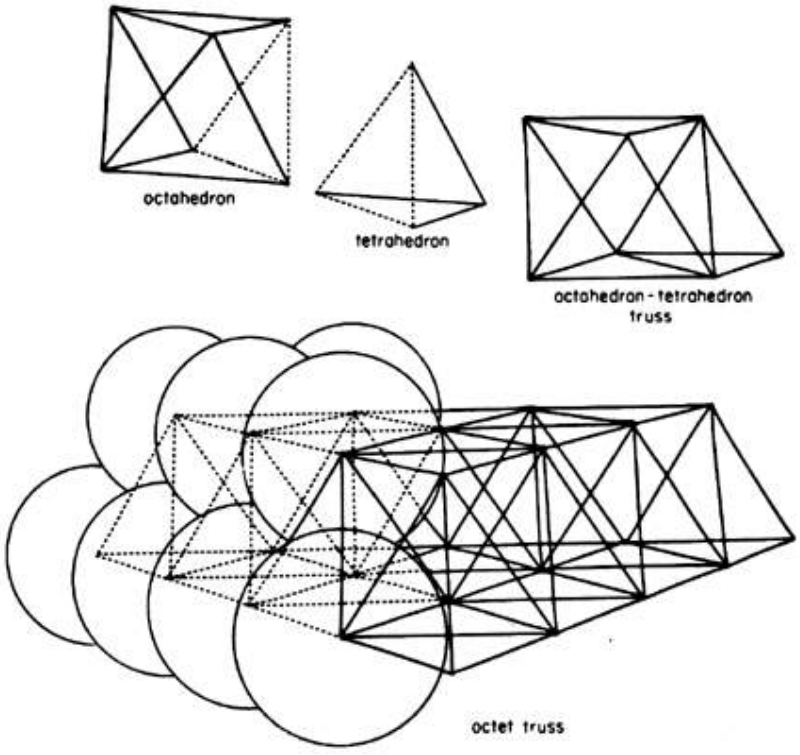

Figure 22: Fuller's Isotropic Vector Matrix (IVM):
The IVM is the vectorial skeleton of closest sphere packing. The IVM is formed from the "complementarity" between the tetrahedron and the octahedron, hence the octet truss. [Image from Buckminster Fuller's *Synergetics*.]

While in Synergetics the minimum *system* is the tetrahedron, Fuller's fundamental *dimension*, however, is not the tetrahedron, but the radial measurement of the unit-sphere of his "isotropic vector matrix," or IVM. Given its omni-symmetrical and hence omni-economical load-bearing vectorial arrangement, the IVM forms the basis of Fuller's invention of the "octet-truss," a critical element of modern architecture (along with his innovative geodesic domes). This feature of the isotropic vector matrix, in turn, is derived from the fact that the IVM is essentially the center-point and vector skeleton of the most economic form of sphere-packing. The sphere, therefore, as the locus of every "point" of vectorial radiation and convergence in the isotropic vector matrix, is central to Fuller's dimensional system (See Figure 22, above), as the first dimension itself.

This radial dimension within each and every sphere of the IVM—and determining, therefore, the *a priori volumetric* distance between every point—recall, is essentially the function of the interface of our "I/T uni-axis,"[i]* i.e. to determine the scale or first transitive "plane" or volumetric field and scale of action, dimension or mensuration. As soon as a boundary is introduced into the omni-non-dimensional continuum (involving exactly "one tetrahedron" or 720 degrees of angular take-out), a first dimension, or infinite polarity and VL-axis (aspect infinity), is already necessarily invoked as the polarity which gives the triune interface of finite unity its context and meaning ("(Finite) Unity is plural and at minimum two"). Without this initial boundary in *a priori* boundless/formless Emptiness, there is no *modelable* or Operational boundary, magnitude, extension, quantity or relation, with which to dimensionally and modelably interrelate anything with anything else.

Fuller lays out the dimensional model of *Synergetics*, saying:

> In conventional XYZ coordination, one-dimensionality is identified geometrically with linear pointal frequency. The linear measure is the first power, or the edge of the square face of a cube. … In synergetics, the first-power linear measure is the radius of the sphere.[ii]

And he says a bit later:

> All of the frozen volumetric and superficial area mensuration of the past has been derived exclusively from the external linear dimensions.

---

[i]* See I/T Interfaces, the Omni-Uni and the Omni-Non, p146, and The (Binary) Cycle of Unity, p254.

[ii] Fuller, *Synergetics* 963.00 … … and for those interested, I'll give in this footnote a few quotes outlining the rest of his dimensional model: (964.01) In conventional XYZ coordination, two-dimensionality is identified with areal pointal frequency. (964.02) …In synergetics, second powering represents the rate of system surface growth. (964.30) Shell Accounting: Second power has been identified uniquely with surface area, and it is still the "surface," or shell. But what physics shows is very interesting: there are no continuous shells, there are only energy-event foci and quanta. They can be considered as points or "little spheres." The second-power numbers represent the number of energy packages or points in the outer shell of the system. … (965.01) In a radiational or gravitational wave system, third powering is synergetically identified with the total point population involvement of all the successively propagated, successively outward bound in omniradial direction, wave layers of the system. … (965.02) … as, for instance, total molecular population of a body of water through which successive waves pass outwardly from a splash-propagated initial circle. As the circle grows larger, the number of molecules being locally displaced grows exponentially. (965.04) Perpendicularity (90-degreeness) uniquely characterizes the limit of three- dimensionality. Equiangularity (60-degreeness) uniquely characterizes the limits of four- dimensional systems. (966.01) In a radiational or gravitational wave system, fourth powering is identified with the interpointal domain volumes. (966.02) It is not possible to demonstrate the fourth dimension with 90-degree models. The regular tetrahedron has four unique, omnisymmetrically interacting face planes—ergo, four unique perpendiculars to the four planes.

These "external linear dimensions" are our familiar transitive axes, external to the immanence within any unitary volumetric scale or frame of reference. Fuller continues on in the same passage… (and please note that this is included merely to give a taste of the complexity and beauty of his system, and its understanding is not needed for the comprehension of Interface Mathematics to follow)…

> Synergetics starts system mensuration at the system center and, employing omni-60-degree angular coordinates, expresses the omni-equal, radial and chordal, modular linear subdivisions in "frequency" of module subdivisioning of those radii and chords, which method of mensuration exactly accommodates both gravitational (coherence) and radiational (expansion) calculations. As the length of the vectors represents given mass-times-velocity, the energy involvements are inherent in the isotropic vector matrix (963.12).

Interestingly, in *Synergetics* Fuller also says, "It could be that the concept conjured up by the mouthed-word sphere itself is scientifically invalid; ergo, it could be that the word sphere is not only obsolete but to be shunned because it is meaningless and possibly disastrously misleading to human thought" (986.235). Fuller means here to distinguish the ideal, absolute perfection of the platonic Form of the sphere from any real-world (experiential/empirical) spherical emergent or form. He cautions, correctly, and always from his experiential basis that we have found no absolute continuity in nature whatsoever, and thus no perfect sphere. He also makes the interesting note that such a perfect sphere would be a perpetual motion machine, with neither input nor output of energy for either entropic (decay) or syntropic (growth) functions.[i]

So with Fuller's caveat on the Platonic sphere, we recognize its use here as such a Platonic ideal category; an abstracted aspect of The Infinite, and that a sphere in the real-world is never platonically ideal or infinitely perfect. Even more, there is never any perfectly detailed frame of reference from which to measure such a platonic perfection. We have already "pulverized the categories" with Nondual Rationalism and the Univocity Framework and need merely to recognize its function and differentiation here. We fully realize that this ideal sphere belongs in the pure-relational, abstract world of mathematics and its philosophy, and therefore also that the sphere is merely the first step in the embryogenesis of the concept from omni-non-symmetry of the ONE to the first omni-directional symmetry and minimal modification of the interface of the ONE-one uni-axis…our first boundary in this EOTC of mathematics as the *art and science* of pure relation.

[i] A fact which would delight Plato, no doubt. And from a trans-foundational and Nondual Rational frame of reference, this is to be expected as there can be no reduction to any form, including the formless.

The sphere is the basic modal infinity as the aspect of bounded omni-symmetry and absolute bounded continuity.[i]*

Fuller's first dimension, therefore, places boundary and volumetric extension at the root of Operational and Interface Mathematics and it sets the scale (transitive plane) for our numerical interrelating operations beginning on the transitive axes (see Fig. 000 below). In Interface Mathematics as well—and in accord with the embryogenesis of the concept—nondual-rational dimension springs from the non- of omni-dimension, or from *a priori* undifferentiated dimensionality itself. Rather than starting from one of infinitely many single, differentiated, uni-directional axes or polarities, we begin with the Infinite Unity of omni-non-dimensionality, and through a differentiate-and-integrate, transcend-and-include operation on the immanent-transcendent uni-axis we derive our first act of dimensioning; the creation of the first "primitive" unit-number 'one,' and its corresponding scale of action and mensuration.

Recall our Cycle of Unity[ii]* and its ONE-one triune-interface at the solidus-vinculum in the vision-logic equation:[iii]*

$$\text{ALL} = \frac{\infty}{\infty} = \text{ONE}$$

...and more visually in the figure below...

[i]* See, Spinoza's Triune Infinite, p270.

[ii]* See, The (Binary) Cycle of Unity, p254.

[iii]* See, VCS Meta-tags: Scope Parameters and Vision-logic Equations, p288.

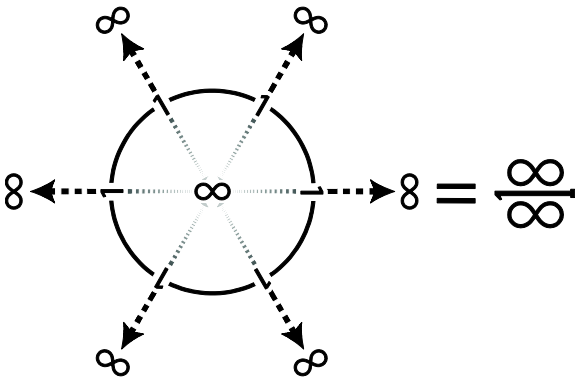

Figure 23: Boundary as the First Dimension:
The first dimension in Interface Mathematics springs from omni-non-dimension, or undifferentiated dimensionality of formless Emptiness itself. Dimension thus *begins* with *a priori* magnitude or scale and is defined as the scale of the selected unit-sphere, unit-number or "real-point." This places volumetric extension at the *root* of Operational Mathematics and it sets the scale for our interrelating operations with the generation of the first or "primitive" level of the holarchically unfolding function of operation and number.

Entirely independently of Fuller, Gerald Lebau recognized number itself as the first dimension without which systems for co-ordination (inter-relation and dimensioning) could not exist. In *The Orb*, Lebau says "The first dimension, 'quantity' is the dimension in which the dimensions are measured." He says in *What It ALL is and Why* [his own comments]:

> For such purposes a Cartesian coordinate system of three mutually perpendicular lines, etc, define a point in this space; a fourth coordinate independent of the spatial dimensions defines an instant in time; and a fifth dimension is always implicit.
>
> It is this fifth dimension that provides meaning to the other four. It has always been present. Indeed, it was probably the first dimension ever invented. [Dimensions are a tool of measurement. They are abstract inventions of the human mind. Of themselves, they do not exist in nature. They are an attribute of metrical kinematics.]

And you can hear Lebau's call for something akin to Fuller's percept-based "conceptuality" or "modelability" when he says:

> There is a real and physical objective relation between all things. That relation is measurable in the dimensions of space and time. The actual relation is absolutely whatever it may be, but the dimensions are relative to the rational fiat of the observer.

Remarkably, Fuller and Lebau have independently converged on many aspects of their systems. Fuller's first dimension is the arbitrarily selected scale of a unit-sphere without which Lebau's first dimension, *number*, could not volumetrically exist because in Operational Mathematics a number-symbol requires a referent, our "real-point." Lebau's and Fuller's ideas merge into the primitive and primary concept of number represented as a minimally complex spherical boundary; a close-up of our finite real-point and the first operational object and finite unity. Calling the spherical real-point a "circular" "needle-sharp point," Lebau says (my *emphasis* and [[comments]]):

> Let us leave our space-time impossible-point in favor of an even infinitely small[i] *circular* point. A "needlesharp" point. Yes, now we have our gradient [[and extension]] again (289).

Lebau and Fuller also independently converged, in very different ways, on the four-dimensionality of mathematical, volumetric "space" (not Minkowskian 3D space + 1D time, but 4D *space*). They each began from the premise of modelability but went entirely separate routes to arrive at the same basic conception. Lebau considered number as the unacknowledged root of dimensioning systems, the very first dimension with which all the others are measured, and Fuller recognized repeatedly that the tetrahedron, with its four primary axes, is the simplest system "in Universe," defined as *a priori* volumetric and extended.

The physicist's ignorance of the roots of dimension in number and ultimately in sub-representational omni-non-dimension, enabled them (and layman alike) to believe that the specifics of our "standard" dimensioning system are separate from mathematics and exist *independently* in the real world. It is commonly thought that "the universe is inherently three-dimensional," but in reality the universe merely has the aspect of dimension (omni-extension) and it is we humans who break it down arbitrarily into specific uni-/multi-dimensioning systems. The universe is not inherently three dimensional, just as it is not inherently twenty-six dimensional. The Universe is extended and thus omni- and non-dimensional because it accommodates and allows any and all possible arbitrary dimensioning systems to function simultaneously depending on utility and function. We will come to find that it is merely *representational relation*, as opposed to Fuller's *structural relation*, that is inherently three-dimensional, and thus unable to coherently and consistently account for the fourth dimension of the "imaginary numbers" which Fuller's dimensioning system can.[ii]*

---

[i] Of course we could take issue with Lebau's adoption of the standard oxymoron "infinitely small," because taken to its infinite extreme "infinitely small" necessarily means "zero-size" (another unavoidable oxymoron) and thus extensionless, but it is clear that Lebau is stipulating a point with real extension, "circular" as a sphere represented in two dimensions on paper.

[ii]* See, The Imaginary as Vestigial Transitive Axis at the I/T Interface, p348.

Side-Note: Euclidean vs. Non-Euclidean Dimensions

It should be clear then that our meta-dimensional beginning in the immanent-transcendent omni-axis is prior to any concept of dimensionality, such as the transitive notions of "flat" or "curved" Cartesian/Euclidean or non-Euclidean space. We should note again as well that the concept of curved-space has no meaning without the identical opposite notion of flat space. In this sense, one cannot be prior to the other, and we will now outline the holarchical and embryological foundations of number and operation free from any *a priori* dimensioning *system* whatsoever, in the meta-dimensional level of sub-representational vision-logic and the VCS.

THE HOLARCHICAL UNFOLDING OF NUMBER AND OPERATION

PHASE ONE: THE IMMANENT-TRANSCENDENT AXIS AS IMPLICIT ORIGIN IN MATHEMATICS

As we discovered in the Cycle of Unity, we transition from the ONE-ALL of the uncountable I/T axis to the ONE-one of the uni-axis and from there we discover, select or create the boundary-interface between immanence and transcendence (represented by the VLE ∞/∞) as our finite unity and the defining scale unfolded as the countable infinite of the "transitive plane" for our desired operations. The inward infinite terminus and implicit singularity of this I/T uni-axis and polarity is our old friend the "ideal point" which we previously kicked out of the finite realm of number and into the realm of the *aspect infinite* beyond modelability. He returns here not as the first primitive number '1'—because he lacks a boundary and finite unity and is only one immanent pole in the uncountable infinity of the omni-axis—but as the implicit singularity or aspect of *relative locality* and *position* upon which the first volumetric aspect of real dimension, number or magnitude, can be defined. [Notice here how the word "define" contains the root of finite. Etymologically it means to assign limits and this is precisely the procedure here.]

PHASE TWO: UNIT-CLOSURE AND THE FINITE UNIT-IDENTITY

Before even number itself comes onto the scene in mathematics, the first boundary in the boundless must itself become manifest in the closure of the first implicit number 1; the object of the operation of counting … 1+1+1+1+ …. This first operation is Kant's operator of existence itself, before the predicate and category of quantity and quality can even arise. This first operation of "unit-closure," prior to even counting itself, represents the formation in the mathematical mind of the primal mathematical *identity* or rigid category ("numerically (or absolutely) identical" to any other of its kind); the number 1, our finite unity as primitive encapsulated infinite number and bounded or modal infinite. "This *one*, and that *one*, and this other *one*… and this other-other *one* … "—being composed of *identical units* (unit-identities), the agglomerative or sequential numbers (cardinals and ordinals, respectively) all begin to sound alike until we give them sequential names in order to differentiate…and thus begins counting from a series of "ones."

As we recall, in The Cycle of Unity this unit-closure as a conceptual breaking of the omni-non-symmetry of the formless, ineffable absolute into the omni-symmetry of bounded relative form (and root Bounded Aspect of The Infinite), takes place from our singular, relative-scope representation of logical-Emptiness, the immanent-transcendent uni-axis. Recall from our Cycle of Unity that this relative unit-identity (or finite unity) is our interface—through the positional aspect in the uni-axis—with Infinite Unity—the absolute, tautological identity of the ALL-ONE. So, even the very first number, the finite unit-identity, is born from a coupling of an identity and an operation in the differentiation-and-integration of the embryogenesis of the concept.

This unit-closure is the separation of the absolute identity of the ALL-ONE of Infinite Unity into its immanent and transcendent poles by the selection of the first omni-symmetrical interface and boundary of our finite unity and abstract, ideal sphere as the basic modal infinity. Thus the unit-identity—our primal relative-identity in the art and science of pure-relation—is born from the polarization of Infinite Unity, or absolute-identity, the ALL is ONE, as we have seen in our Cycle of Unity. The sphere is, in this sense, the closest possible relative representation of the omni-non-symmetry of the ONE, in the omni-symmetry of the *one*. This is perhaps why the ancients held such a high place for the sphere. It is the interface of the

ONE and the one, the abstracted essence of man himself in his relation to God.

There is, then, a critical Heraclitean polarity of identity and operation; noun and verb; stasis and flux, implicit from the very beginning of this embryogenesis of the concept of mathematics and number, and we will find it recurring throughout … and as we have already seen in the Univocity Framework.[i]*

From the aspect of the boundless absolute, no number exists. Like Form emerging from the concept of the formless, number emerges from the numberless—the finite from the Infinite, and representation from sub-representation.[ii] The sole purpose of number is the interrelation of modifications or differentiations as abstract pure-relational categories in the relative world of form—specifically between those found at the interface of the observer and the observed. Thus without modifications and their perceived boundaries numbers would never evolve, there would be no distinct "objects" to count and numbers would serve no purpose.

Number is a tool for dimensioning. Operationally, this begins with the simplest (most symmetric) volumetric geometry, the sphere, as abstractly representing the first extended or modelable number or distinct physical magnitude. The primary number '1,' as we saw in The Cycle of Unity, appears as a boundary between immanence and transcendence, and as the basic modal infinite.[iii] From this first volumetric number we have an identity and a scale to modelably replicate and interrelate all the other numbers, and this interrelation of predefined unit numbers is the transitive axis (see Figure 24, below). However, given that each unit-identity is composed itself of a bounded infinite, then each composite number is a primitive infinite number, whose infinity is simply encapsulated in the unit-identity itself. The breaking of this encapsulation of infinity doesn't occur operationally until the invention of the ratio, in our holarchical EOTC of number and operation.

[i]* See, Principle 5: Chord 4: The Principle of Infinite Determinism (PID), p186.

[ii] This is not a temporal priority, but a logical one. One cannot conceive of form without something to be formed, nor the finite without the infinite (see Spinoza). But it must always be understood that this is a polarity. The Numberless (infinite) turns around number, just as Emptiness turns around Form, and Substance around its modes.

[iii] As Shakespeare's Hamlet says, "…I could be bounded in a nut-shell, and count myself a king of infinite space…"

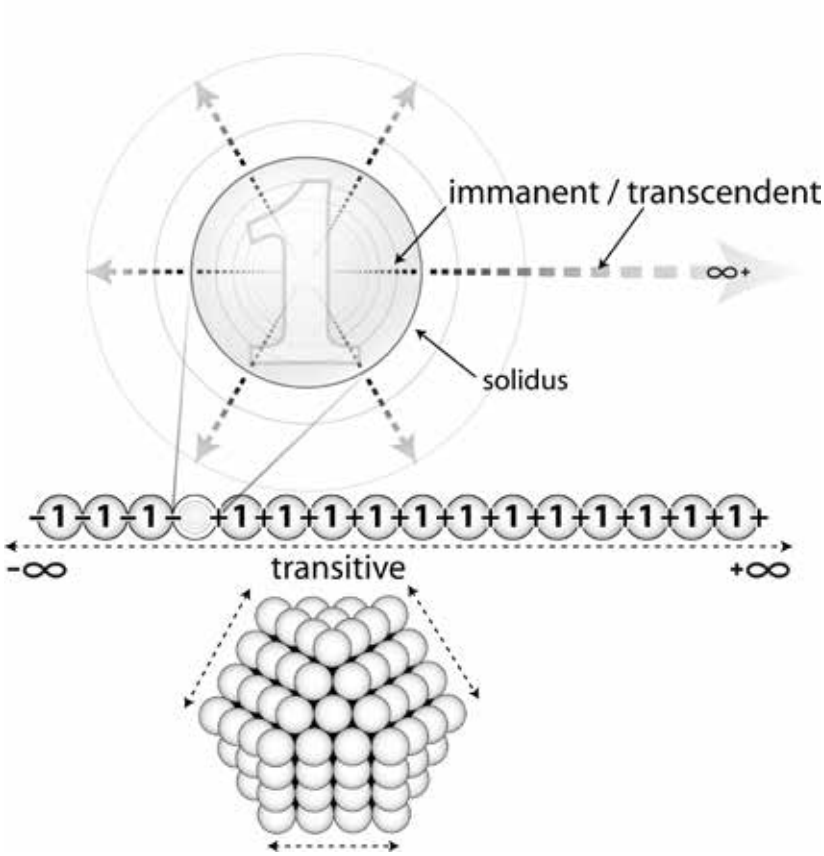

Figure 24: Transitive and I/T Relations:
The transitive axes deal with inter-unit relations, and thus with countability. The I/T uni-axis sets the scale for the first unit and the transitive axis deals with initiating the holarchical levels of inter-unit operations beginning with addition and subtraction. Once a unit is defined and the scale of inter-unit relation is set, agglomerative complexity can begin. But also see how through agglomeration the *size* or *scale* of the object is increased? This is how the transitive countable infinite maps to the transcendent pole of the uncountable Immanent/Transcendent axis (see trans-trans-bias below). Given that each unit-identity is composed itself of a bounded infinite, then each composite number is a primitive infinite number, whose infinity is simply encapsulated. The breaking of this encapsulation of infinity doesn't occur operationally until the invention of the ratio, in our holarchical EOTC of number and operation.

PHASE THREE: THE TRANSITIVE-AXIS AND AGGLOMERATION

> *God made the integers; all else is the work of Man.* —Leopold Kronecker

Without "fundamental" units or pure-relational categories in mathematics,[i] the complex inter-relations needed for higher level (transcendent) patterning and systems of rules could not emerge. In the absence of the agglomeration of solid structural elements—such as the rigid pure-relational categories of the natural numbers—morphological "excellence," evolution and human cognition, could not occur. And hence, without all these there would be no purpose, and no possible origin for mathematics. Mathematics is, in a sense, agglomerative dimensioning for agglomerative beings.[ii] The transitive axis, then, *begins* with our first noun-verb, identity-operation coupling, the linear inter-operation or agglomeration of unit-identities, otherwise known as counting.

[i] … or basic "matter-units" in physical reality (e.g. atoms)

[ii] Plato's descent from the "forms" to "matter" lies buried in this polarity between the elemental monads and their compounds and emergent representations.

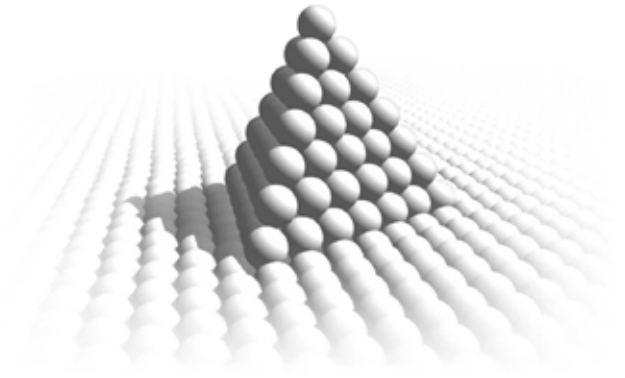

Figure 25: Agglomeration and Transitivity:
Agglomerative relation is the first primitive field of transitivity.

The Image of the Trans-Trans-Bias

The transcendent-bias, recall, is the general tendency of the mind (which is emergent and transcendent already) to favor transcendence (yang) over immanence (yin) in its implicit functioning. This bias or tendency includes the failure to acknowledge the transcendent level of initial emergence itself in the mind (or any other finite unity), and the immanent origin, of thought or representation—conceiving it, rather, as fundamental or foundational. The mind begins its search for order and understanding always from this lofty perch of emergent order and generalized abstraction. The failure to recognize either 1) this transcendent or emergent level or 2) its generalized and abstract properties, can generate many false problems in philosophical or meta-mathematical thought. These include, as we have seen, the problematic assumption of foundationalism and its "disastrous infinite regress," or the missing beginning of eternity.

Recall from the discussion in Foundationalism, the Infinite Regress and the Transcendent-bias, that this peculiarly medieval problem stems from the failure to recognize the transcendent or emergent nature of thought, matter and/or time and its implications on the nature of immanent or transitive causation. It starts from looking inward or backward from the perch of *a priori* emergent thought and seeking in this backward way an arbitrarily imposed ultimate substrate-level or origin event. When the problem of creation *ex nihilo* arises from the arbitrarily imposed concept of an ultimate substrate-level, or when the necessary absence of an origin event in an infinite temporal chain is realized, a transcendent-biased mind sees a "disastrous" regress because the expected ultimate substrate or event, which

must begin or ground the transcendence or emergence, cannot be found in the boundless face of Emptiness. It is the negative view of infinity—which starts from the tacit level of emergence/transcendence and seeks an imagined and preconceived origin—that causes the disaster of the regress.

The "trans-bias," on the other hand, is the combination of the ***trans***cendent-bias and the ***trans***itive-bias. This is sometimes called the "trans-trans-bias" to emphasize this dual mapping, but the terms are ultimately the same. The trans-bias is the default tendency to think in terms of both ***trans***itivity and ***trans***cendence, and to map the one in terms of the other at the expense of neglected immanence. The countable infinite of the ***trans***itive axis tends to map directly to the ***trans***cendent pole of the I/T axis, entirely bypassing the uncountable immanence within. Any "plane" of transitivity is necessarily relatively *transcendent* from the deeper levels of immanence and the immanent pole of the I/T axis. The trans-bias is a more specific form and consequence of the objective-bias where much of the functionality of the subjectivity of the individual is taken up in service of extrinsically directed activities (*conatus*) such as perception and social functions (communion). Indeed, the algedonic[i] projection-polarity of fear and desire is inherently *externally oriented* and projected *towards* the object *of* that fear or desire.

Transcendence, growth and evolution, for agglomerated and emergent beings, must take place through the appropriation of *external* resources. And hence, just as in rational mathematics, the immanent infinity of the I/T axis is hidden as *undefined* under the cipher on the immanent side of the solidus or vinculum,[ii]* so also, in the default scientific materialism of modern thought, the immanent infinity of the emergent subject is hidden under the cipher of a demoted "subjectivity" by a reduction to the object in a flatland materialism.[iii]

This becomes starkly obvious in the fact that the default transitive axes of mathematical graphs, the Cartesian coordinate system, maps directly to the transcendent pole in the one-to-one "identity line" of the default function y = x (See Figure 26, below), while it entirely bypasses the immanent direction altogether. Note that there is a hidden ratio here, and that beneath the x of any integer there is a division by 1. This is the unit-closure of the natural numbers, the first dimension of number itself in the cycle from Infinite to finite unity—the ONE to the one—and maintained up through the integers. Unit-closure is not broken until we get to the rationals—which reveals the

[i] Relating to pleasure and pain

[ii]* See, The "Labyrinth of the Continuum" and the Principle of Nondual Rationalism p71.

[iii] This flatland is a tacit function of a proto-rational, trans-biased neo-Cartesianism generated as the shadow-element of the aborted rationality of modernity. And so the proto-rational Descartes is enfolded in the "History of Philosophy" as the "father of modernity" or rationalism rather than the fully rational/modern Spinoza or the mostly rational/modern (and secretly Spinozist) Leibniz.

hidden unitary divisor beneath the integers and below—as it breaks closure, the trans-trans-bias and identity-line mapping, opening up mathematical operation into the immanent-transcendent axis.

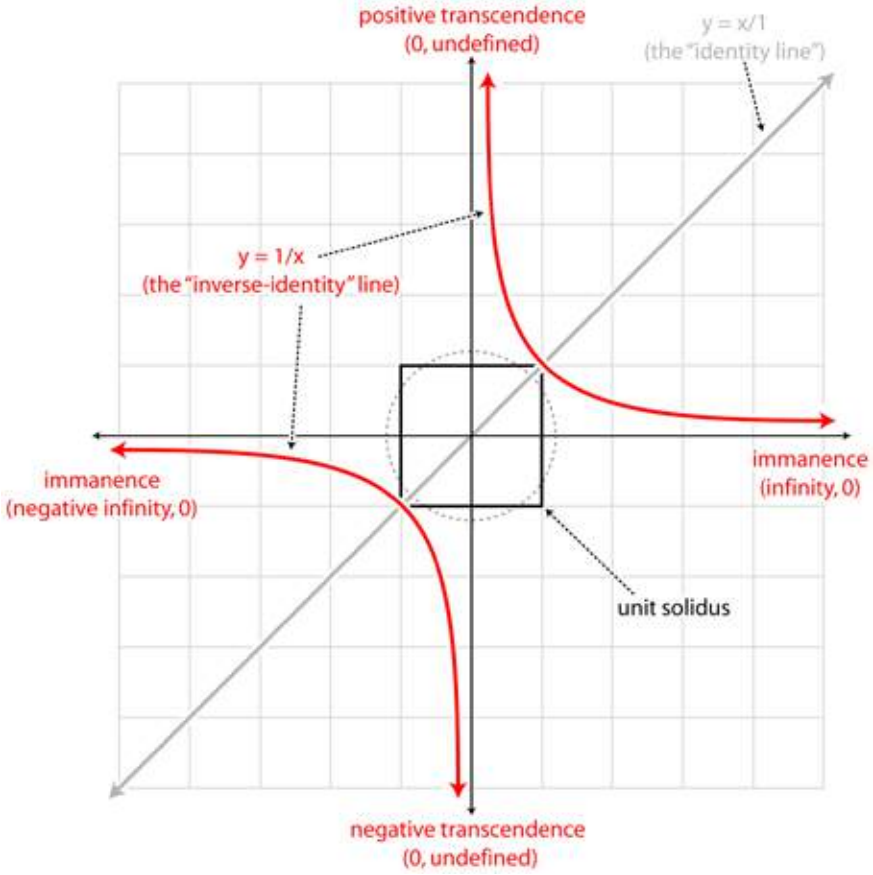

Figure 26: The Image of the Trans-Bias in the Cartesian Graph and the Identity Line: Note how the graph of immanence in the *inverse*-identity line crosses the unit boundary in its outward mapping of the immanent/transcendent infinity.

The default space of mathematical graphs is this pre-rational transitive space of the integer, which includes the transitive bias inherited from the unit-closure of the Naturals and its agglomerative, expansive, emergent, transcendentally-directed functions. The immanence opened by the mathematical ratio is truncated at zero and entirely bypassed, on the way down the line, into the negative transcendent-transitive direction of the integers. From the space of the trans-bias—as seen in the pre-rational

function of the identity line—this mapping is perfectly straightforward, a straight line, but once we begin mapping the immanent space of the rational functions—as seen with the line of the "inverse identity" function—the intrinsic distortion becomes apparent (as seen in Figure 26, above).

The negative numbers on the graph of the identity line don't map toward immanence at all, but merely toward the negative infinity of transitivity and transcendence (or the macro-scale, in terms of debt rather than payment). Note how the infinite division of the x in the denominator of the "inverse identity" function becomes mapped transcendentally or outwardly on the graph as it moves ever closer to the x-axis. This is the distortion of the immanent space of the rational in the default trans-biased transitive and pre-rational space of the Cartesian coordinate system.[i] The immanence and continuity of the Rationals is indeed found after-the-fact on the transitive number-lines, but it is not mapped in terms of its own axis, and only in terms of the pre-rational transitive axis of the integers. The rationals, recall, are operating on a fundamentally new axis, the immanent/transcendent, but this axis is where the unit-identity was generated in the first place. Already we can see the binary interaction between the two VL-axes in mathematics.

The simplest function, $y = x/1$, is an identity mapping between the transitive axes and the transcendent direction, extending transcendence and transitivity as one, to infinity, while the immanent pole, and the intrinsic immanent-transcendent axis of the Rationals gets bypassed (See Figure 27 below). Immanence is mapped transitively to transcendence, having no intrinsic place in the default visual space of mathematical graphs.

[i] And of course this is a function of pragmatism in that it would be extremely difficult to make such an unbiased graph system, let alone make it the basis of mathematics. This is the real, physical basis behind the trans-bias, and again the point is merely to acknowledge it and explore its implications and affects on mathematics and philosophy as a whole.

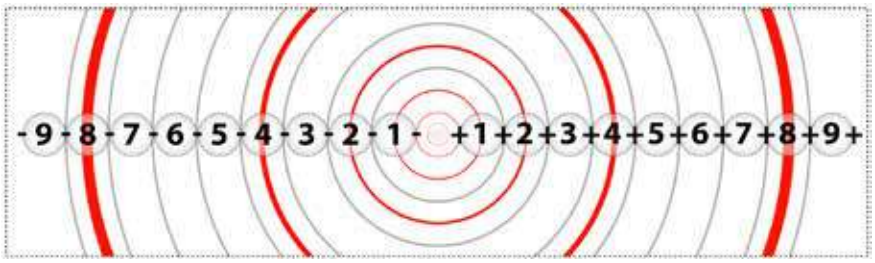

Figure 27: Numbering the Infinite:
Note here how the trans-bias of the integers (gray circles) bypasses and ignores the immanent space of the Rationals (red circles). This is the default integer space of the pre-rational Cartesian coordinate system and the default space of visualization in mathematics.

This default pre-rational integer-space of the mathematics—and hence the default "visualization paradigm" for mathematics itself—is perhaps the main reason that the rational zero is still not officially recognized as the immanent infinity that it is, but remains "undefined" to this day in mathematics.[i] The project of Rationalism, and nondualism, in both mathematics and philosophy, is unfinished, and this work is illustrating its ancient roots in the nondual. Recall, for example, this passage from the Tao te Ching;

All things have their backs to the female
and stand facing the male.
When male and female combine,
all things achieve harmony.

Transitive Number as Agglomeration: The Natural Numbers

Number, in mathematics, is a function of utility, and it requires the ability to differentiate and map *between* unit-identities or agglomerations thereof. The number *one*, for example, being numerically identical to any other *one*, cannot be differentiated from it. And a group of *ones*, is difficult to distinguish from a similar group of *ones* of a slightly different number, especially as the numbers grow large. Therefore, the first "numbers" recognized as such in the embryogenesis of mathematics are explicitly

[i] The trans-bias, by the way, also shows up as a positive bias on the number line and in additive and multiplicative operations, as we will see.

categorical agglomerative-units, already products of the earlier implicit identity-operation coupling of unit-addition in counting finite unities (or digits) and labeling them sequentially or stepwise.

This noun-verb, number-operation, coupling of unit-identities with each other, 1+1+1+1+1… gives us our next holarchical level in the embryogenesis of the concept of number: the "natural numbers," 1, 2, 3, 4, 5, … These can be called the "numerical identities" of mathematics, because, in a very deep sense, the "natural numbers" are the natural root of our absolutized concept of number, as abstracted aspects of quantitative relation. They are eternal absolutized categories. A number 3, for example, is always "numerically identical," in its abstract categorical nature, to any other number 3, "from now until eternity."

Recall, also, that this hidden quantized agglomeration of unit-identities in the first mathematical operation of counting is only explicitly revealed with the breaking of unit-closure in the advent of the mathematical ratio, when it becomes recognized that beneath every integer (e.g. 3) there is hidden solidus and unit-identity (e.g. 3/1).

Once the boundary is drawn circumscribing the first-, or unit-magnitude, the primary "unit-closure" of the "pre-number" '1' can then be added with other units to form the secondary (or compound) numbers (see Figure 28, below). This is the beginning of a real, physical, finite (or indefinite) number-line and it is the beginning of modelable dimensioning. Note that this Interface-Mathematical number-line is also a three-dimensional extended shape (albeit generalized into pure relation), therefore it *a priori exists*, or can interface with objects existing, in the real, visual and modelable world of volumetric extension, rather than waiting to exist until zero-extension has been multiplied to the 3rd power, from an "infinitely thin" zero-depth plane into a cube. Conversely, the one-dimensional line with zero-thickness can only exist in the ideal world of abstract mathematics, as a linear aspect of The Infinite; an aspect infinity.[i]* And so in Fuller's terms our real-line is *a priori* modelable.[ii]

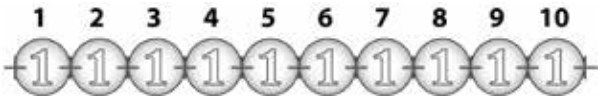

Figure 28: The Primitive Numerical Identities:
The first true mathematical numbers are compound numbers, agglomerations of the pre-number, the unit-identity, 1. These are the "Numerical Identities".

[i]* See, Spinoza's Triune Infinite, p270.

[ii] This is a spatial line, or a vector from the operation of set-generation, as opposed Fuller's essentially temporal vectors made from tracing a unit through its motion in space.

At this level of abstraction, Interface Mathematics demonstrates its superiority in modelability and its deep connection with empirical reality. Conceiving of these transitive axes as agglomerations of unit numbers reminds us of the logic-fact that each directional axis is arbitrarily chosen from an infinity of possible others. And similarly, conceiving these unit-identities as I/T interfaces reminds us of the unbounded possibilities of scale of each of these units. And keeping all of this visually in mind, when we come to divisions into the unit sphere (in the rational numbers), we will remember that we have crossed a primal boundary in the embryogenesis of mathematics and are working on another VL-axis altogether. Given that the transitive-axis begins in counting itself, it is natural to see that it pertains to Cantor's countable infinity, as it breaks ever deeper into counting the uncountabilities of the I/T axis.

Addition and Closure on the Transitive-axis

With the first coupling of unit-identity and operation (the 1 and the operation of addition), the infinite set of our "numerical identities," are formed, as the *set-aspect* (or set-generator) of counting by ones. This inherently indefinite operation gives us our first "infinite set," the natural numbers.

In mathematics, there is a relation between sets and operations known as "the closure property." It states that a set is closed, *with respect to an operation*, if those operations, on any of its elements or subsets (our Natural numbers so far), return only other elements *within* the set. If an operation on a set, however, produces a value that does not exist within the set, then the closure of that set is "violated" by that operation. Given that our set of Natural numbers is infinite, or unbounded, and that if you add any Natural number with any other, you merely get a larger natural number, therefore, with respect to addition the Natural numbers are closed.

Counting is a function of unit-addition, or the addition of unit-identities: 1+1+1+1 … . It is the first stratum of a recursive layering of addition, which is the first mathematical operation of agglomeration, and it generates its own infinite set (the Natural numbers 1, 2, 3, 4, …) with its own closure property with respect to the first operation of addition (and recursive addition or multiplication). So we see here that the first number-set, the naturals, is generated by the first operation, addition, a mathematical form of unit-agglomeration. We can already see the trans-trans-bias at work with the *first* mathematical operation and its generated number-set being a form of stepwise agglomeration, *infinitely* increasing *scale*, mapped to a transitive number-line. At this point in the EOTC of mathematics we have only this symbolic agglomeration and the infinite set of Natural numbers it generates.

This simple operation, however, hides an important polarity and a default directed bias; that of *input and output* and the trans-bias toward increasing agglomeration entirely bypassing the immanence within the unit-closure upon which this whole process is erected. This implicit uni-directed polarity, as we will see, directly encodes agglomeration as the trans-bias transcended-and-included in mathematics and the pre-rational Cartesian graph system, as it maps, by default, the aspect of agglomerative growth in evolutionary transcendence to the transitivity of the natural-through-integer, or pre-rational numbers. If we break this primary unit-addition process down to its visual/visceral real-world experiential elements from which it evolved in the first place, we can begin to see the simple input/output polarity in action. [To make it quicker to read, we will often call the input/output polarity, simply the "iopol," although we will transition into it gently, to aid in quick memorization.]

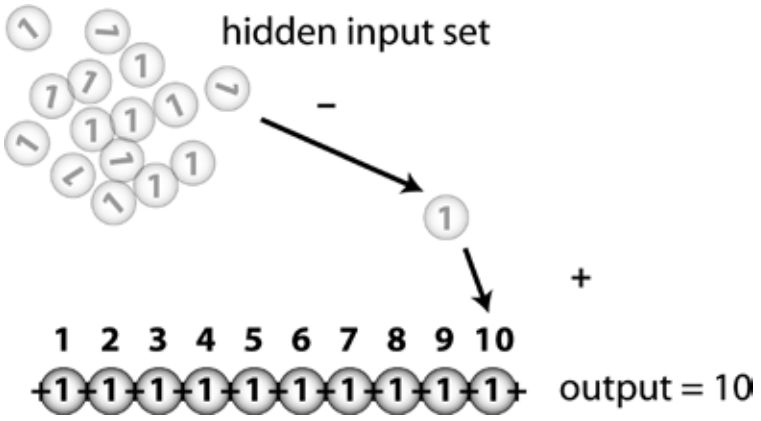

Figure 29: The Implicit Input/Output Polarity (Iopol) of Addition and Subtraction: In this figure we can see that addition is a reversed subtraction, in the triune movement of the unit-identities from the hidden implicit set into the explicit natural numbers.

Imagine that there exist two sets of units; one that consists of a single unit, our selected unit-identity (1), and another which consists of a pile of undifferentiated unit-identities (See Figure 29, above). The pile is sitting hidden in the background, and it is our implicit *input* set from which we will draw in order to *out-put* our agglomerating and differentiating number in the process of unit-addition, or counting, creating, in the process, the set of natural numbers.

So in order to add a number to our explicit unit in the first place—to make our first step from the pre-numerical 1 and into the natural

numbers—we must first *draw from* our implicit set (hidden in the background of mathematical thought), composed merely of undifferentiated unit-identities. So we see this simple polarity in the processes of addition that implies, and even necessitates a hidden *subtraction* from the undisclosed, and uncounted set of unit-identities. This is the polarity of addition and subtraction as a function of the implicit input/output polarity (iopol). As any unit-identity is counted and added to the set of natural numbers, it is simultaneously subtracted from the implicit input set. (see Figure 29, above) This is another aspect of Kant's operator of existence, drawing the possible into the light of the actuality of existence before which any predicates can be assigned.

Subtraction, Closure Violation and Transitive Zero as Negation

When we reverse the default agglomerative direction (trans-bias) of this input/output polarity (iopol), and begin recursively *taking away* from our agglomerative natural number—taking its component unit-identities out of the picture and into the hidden implicit set from which they came—eventually we end up at our initial unit-identity, 1. But there is no logical, visible or visceral reason why we can't, as well, place this last unit-identity into the implicit "erewhon" from whence it came, in effect negating this number-line itself along with its last primitive unit-identity. So we take this last unit away and get our first concept of *zero as negation*, "violating the closure property" of the Natural numbers with the "new" operation of subtraction. It is the reversal of the implicit iopol, however, which initiated the operation of subtraction, which, in turn, led to this violation of our first set-closure. This will be a recurring theme in the ratcheting, holarchical expansion of the symbiogenetic function of number and operation.

Interestingly, Bucky Fuller claims, in his historic 42-hour audio/video session *Everything I Know*, that it was the invention of the abacus which led to the cipher, or what we are calling 'transitive zero.' We can see this clearly in Figure 30, below, where the input/output polarity (iopol) itself is directly instantiated in the physical pole on which the unit-identities (represented by the "ones" beads) slide. On this now explicit polarity, for addition, the left-hand set is the (previously-implicit) input set, and the right-hand set is the agglomerating output set. But when we simply reverse the direction in which we slide the units, we also reverse the iopol and begin the operation of subtraction. It is easy to see that transitive zero is naturally formed when the last of the agglomerated set is finally removed back into the left-hand implicit input set from whence it came. This transitive zero is naturally often considered as part of the set of natural numbers, but it wasn't actually invented for many hundreds of years *after* the initial natural numbers, and it

is likely that the simple physical embodiment of the iopol in the bi-directionality of the abacus rod, *naturally* led to its invention.

On the transitive axis, therefore, zero represents the *negation* or absence of a unit or agglomerative number brought about in the "violation of the closure property" of the Natural numbers with the advent of the operation of subtraction in the inversion of the iopol of default (trans-bias) addition.

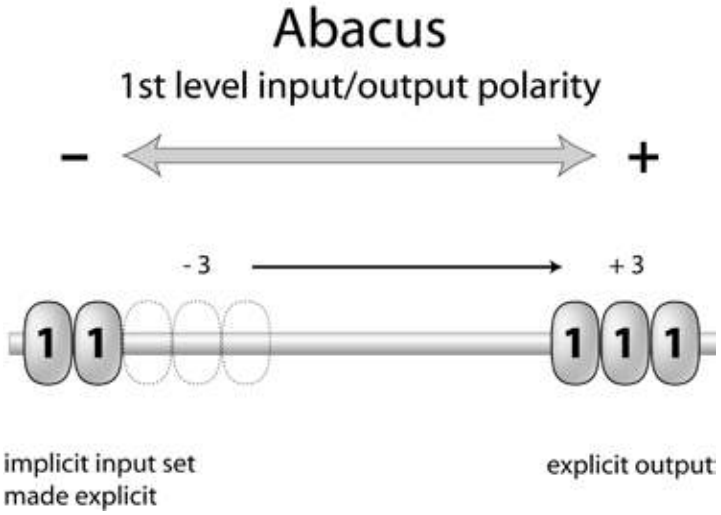

Figure 30: The Abacus and the Iopol:
The Abacus as physical instantiation of the input/output polarity. Fuller argues that it was the invention of the abacus that led directly to the invention of the cipher, our transitive zero. This is because it operationally instantiated the implicit input/output polarity in the bi-directionality of the rod upon which its units moved.

Note that the set of natural numbers, generated by the first operation of unit-addition, was initially "closed" *without* zero, and the closure of the set of Natural numbers is only "violated" with the inversion of the input/output polarity (iopol) in the second operation, subtraction, which led to zero. Note also that even though visually, physically and causally you can't subtract any more unit-identities from zero as nothingness, the operation of subtraction—abstracted in the mind into symbolic relations (and on the abacus rod)—*can indeed* continue, such as, for example, when we imagine it as a sort of debt to be repaid when you *do* get a positive amount of unit-identities in your explicit set. It can also be visualized on the abacus as adding more unit-identities to the left-hand, negative set from some other implicit set. Therefore, not only does the iopol inversion of subtraction open up to us the important concept of nothingness, the cipher, but it opens up

the physically imaginary, but extremely (and fiscally) useful, realm of negative numbers.

So, with the inversion of the iopol to reach the identical-opposite of addition in subtraction, we get the set of whole numbers, with the addition of zero, and then we get the integers as we bypass the immanence inside of each unit-identity and move into the transitive operational polarity implicit in the set-generating aspects of addition and subtraction.

It is only when we operationally recognize and reverse the polarity of input and output that the positive-negative polarity of the transitive axis, in orthogonal relation to the immanent-transcendent axis, is completed in its numerical representation in the integers. After breaking the closure of the Naturals to give us the new digit zero, the use of subtraction beyond the natural conditions of visual or causal logic, breaks the closure of the whole numbers to give us the integers, and we have our next function of zero as the "origin point" on the transitive axis of the emerging transitive Cartesian co-ordinate system.

Transitive Zero: A Return to Origin

As an origin of a number system, zero on the transitive axis is just another number, but with privileged status as existing in its own unique neutral and null zone (the "additive identity") between the positive and negative directions on the transitive axis. Transitively, zero can be reached as simply as any other number because it is the negation of number.

This zero-as-negation, is in direct contrast, as we have already seen, with zero on the Immanent/Transcendent axis, the rational immanent zero, as inverse infinity, absolutely unreachable and *not* a number, i.e. "undefined." Note also, however, that in The Cycle of Unity this zero is where we started, the origin, as the immanent pole or implicit singularity of the immanent-transcendent uni-axis. So, in an oblique sense, the violation of the closure property of the Naturals brings us full-circle, on the transitive axis, to the immanent origin of the numberline, from which the transitive axis of the agglomerative pre-rationals exfoliated in the first place…

But this process of negation in additive iopol reversal is not complete. It cannot rest at the origin—which is insignificant from the frame of reference of the transitive axes—hence it passes right on by the implicit singularity of the rational zero as if it did not exist, because at this point in the EOTC it lacks the function (the ratio) to access it. The continued "violation" of this closure property in subtraction, however, brings us past the origin into the imagined realm of negative numbers, and we have the "oppositional forces" of quantitative transitivity.

The Implicit Recursion of Numerical-Addition

Just like the first finite unity or relative unit-identity was generated by the noun-verb coupling of a pre-mathematical division or interface of the I/T uni-axis and its absolute identity in the ONE-ALL (recall our Cycle of Unity), so we have already seen that the first set of numbers, the naturals, was generated by the noun-verb, identity-operation coupling of "unit-addition"; i.e. 1+1+1+1... . This is the first level of addition, implicit in the Natural numbers themselves as the "first dimension" of number. It is characterized by the implicit unit-closure explicitly revealed only when we get to the Rationals by the default unitary divisor hidden underneath the implicit solidus of every pre-rational number (or integer).

When we then move from unit-addition to the addition of the compound numbers or the "numerical identities," we are already at the next level of the unfolding recursive holarchy of the noun-verb coupling of number and operation; i.e. 3 + 8 = (1+1+1) + (1+1+1+1+1+1+1+1). The integers are already products of recursive addition, so what we generally call addition is already the second level *holarchical* recursion of addition. And as "numerical-addition" is a recursive, or second-level unit-addition, numerical-subtraction is a second-level unit-subtraction.

As opposed to the one implicit invariable input-bead of the ones-level of the abacus and the first level input/output polarity (the one unit added recursively to the agglomerating whole)—at the second- or numerical-level of addition, there are two inputs; one implicit and invariable (the unit-identity), and the other explicit and variable—the infinite set of "numerical identities," transcending-and-including the unit-identities. This is the differentiation-and-integration of function in the EOTC of number and operation.

PHASE FOUR: TRANSITIVE INTERFACING WITH THE I/T AXIS

The Immanent/Transcendent axis, we have seen, like all aspect infinities, is prior to mathematics and operability. Like the imaginary absolutized categories of the Platonic Forms (or even our natural "numerical identities" and digits), it is therefore, by definition, ultimately abstract, invisible, un-modelable and inoperable, in and of itself. It must be accessed, visualized, mobilized and *actualized* bit by bit through the real-illusions, forms, interfaces and operations of the relative scope, beginning with the operations of transitivity, in the same sense that Substance must manifest itself—to itself, and through itself—as pure emergent and unpredictable potential, in actual modification, nucleation, evolutionary agglomeration and complexification (Emptiness in form).[i] In the same way, the implicit I/T axis—which was the implicit origin of the finite unit-identity interface in the first place[ii]*—must be accessed and realized through the evolution and embryogenesis of the noun-verb coupling of number and operation itself, as we will continue to see evolving with it through its embryogenesis into the higher-level functions, operations and numerical identities of mathematics.

Multiplication Through Division

We have already seen the polarity of multiplication and division in the structure of the embryogenesis of the concept. Cellular division is this process whereby multiplication occurs specifically through division. Similarly, multiplication in mathematics functions on the implicit division of every single digit or numerical identity by the scale-defining unit-identity hidden under the implicit solidus. Indeed, that solidus is simply one means of making explicit this initial set-generating unit-multiplication, in terms of the division aspect of the unit-multiplication/-division polarity making up the numerical identities. As such, in a sense, we can and should view every solidus or vinculum as an inverted multiplication sign, and vice versa. See Figure 31, Level 1, below.

[i] It is my current assumption and discovery that the unconscious accidental conflation between these two unknown operational axes causes perhaps all of the known paradoxes in ancient and modern Western meta-/mathematics, as we have already begun to see. We will address many more of them as we continue to explore this holarchical unfolding of number and operation.

[ii]* Recall The (Binary) Cycle of Unity, p254.

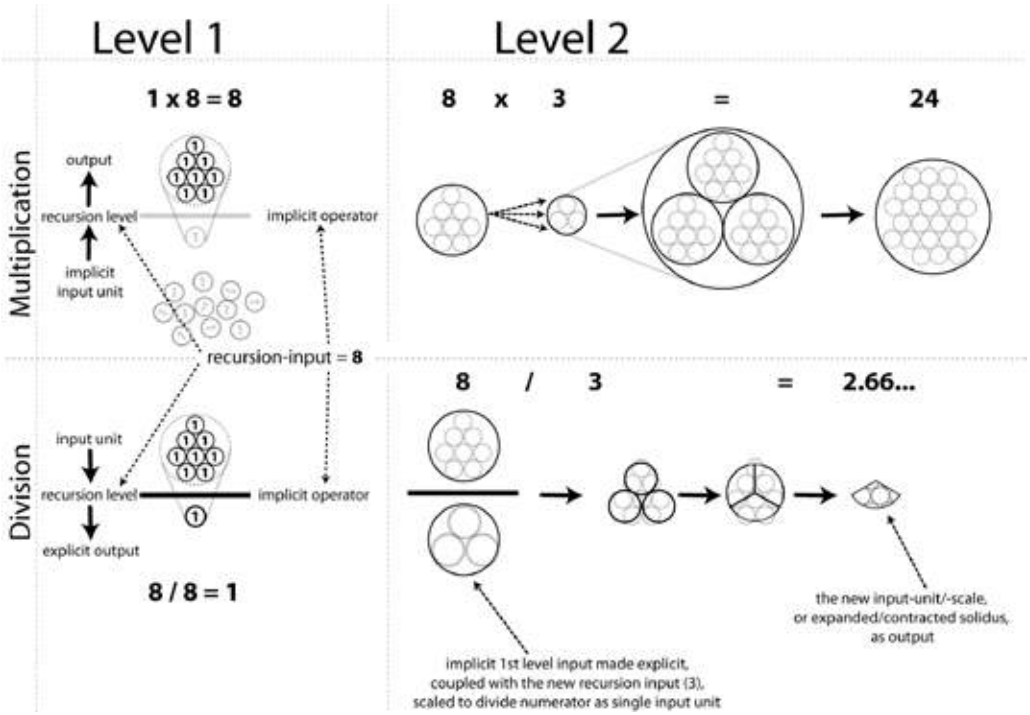

Figure 31: The Iopol of Multiplication/Division:
In this diagram we can see that division reverses the input/output polarity of multiplication violating the implicit unit-closure of the hidden immanent denominator to the infinite variability of the transcendent infinity of the natural numbers.

Addition and multiplication in mathematics can be differentiated simply, and intuitively by the function of recursion. Addition is clearly a small-scale or local first-level of agglomeration, or the agglomeration of just a few different or similar numbers together, whereas multiplication is the second level recursive or automated agglomeration of the same number over and over, a given number of times. What we generally call multiplication in mathematics, as we have seen, is recursive *numerical*-addition…which is already recursive *unit*-addition used implicitly to create the numerical identities or digits themselves. Taken in reverse, in terms of the input/output polarity, and we have unit-level division and subtractions, differentiated again simply by the function, or viewpoint of recursion. Indeed, it is this first order of recursion that ensures that our function of division maps to merely stepwise operations and thus only to the countable

infinity of the transitive-axis, rather than to the uncountable infinity and full continuity of the Immanent/Transcendent axis.

In this way, our recursive unit-addition in the set-generation of the Naturals and digits, can also simply be called unit-multiplication, and we can see that multiplication and iteration already exists implicitly with the set-generation of the first numbers. This is why the number 1 is the "multiplicative identity." It is already implicit as the unit-identity in each of our digits because, for example, the number 8 is *already* the unit-identity iterated or multiplied 8 times. Multiplying by the unit-identity, then, simply starts again at the beginning of the process that led to the generation of the digits in the first place.

Multiplication is a pure-relational automated synthesis; one input iterated according to the value of the *second*. In this sense, but very loosely, multiplication can be seen as a *doubled* addition, acting in two dimensions, instead of one. See Figure 32, below.

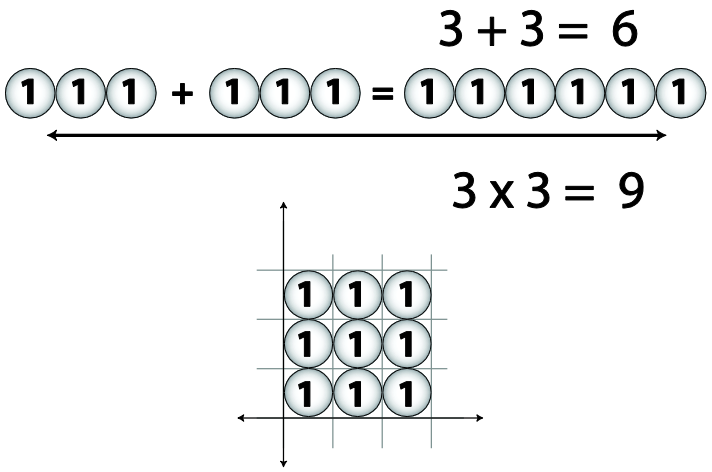

Figure 32: Doubled Addition:
Multiplication as a "doubled" addition moves us into the first quadrant of the pre-rational Cartesian axis, and transcending-and-including the transitive sign of the integers, the other quadrants are inhabited.

In the rectilinear Euclidean system, with multiplication we move, in a sense, from the transitive line into the Cartesian plane, and the y-axis becomes the axis of multiplication acting upon the x-axis, to create the first planar quadrant of the Cartesian graph; the upper-right agglomerative/intensive quadrant. Transcending-and-including the oppositional transitive sign of the integers in each of the two first dimensions, however, this takes us from the first quadrant in the default graph of the pre-rational—the purely

agglomerative/intensive—into the other three quadrants of the Cartesian plane. Though, as we will see,[i]* multiplication can just as easily invoke an inherently non-Cartesian and non-Euclidean plane, based on the triangle, for example, as in Fuller's Synergetic Geometry. This we will see in the simple fact that a triangular multiplication table is inherently more efficient than a square one, which also demonstrates, along with other concepts that we'll explore, that powering is not inherently "square" in nature, but can be more economically and optimally seen in "triangling" and "tetrahedroning" as opposed to "squaring" and "cubing."

And as we would expect, division is the iopol reversal of multiplication; a second-level recursion of unit-subtraction and a pure relational analysis. But there is a crucial difference here with this iopol inversion from multiplication to division. In multiplication it makes no difference which number is multiplied by which; multiplication is "commutative." This is because in multiplication we are operating in the default agglomerative (trans-bias) mode with the implicit unit-identity as the transcended-and-included first-level input, and addition is the "quantized" set-generation process that fulfills itself, with its full input/output polarity reversal, in generating the integers.

See Figure 33, below for a simpler way to visualize the commutativity of multiplication. In the MULTIPLICATION section of the figure, A and B represent the two orders in which the two input numbers can be arranged. In spatial terms, the areas drawn out by each are identical and indeed they can be seen as the same rectangle in a different orientation. It is the commutativity of multiplication that expresses the agglomerative, oscillatory reciprocity of the closure property of multiplication with respect to the input integers, and unit-closure itself.

In division, on the other hand—at the second- or numerical-level—rather than the unit-identity itself as the standardized default transcended-and-included agglomerative input, and iopol-reversed as the divisor—the job of unit-identity has been opened up to the infinite variability of *any* numerical identity (the integers, so far) and then iopol reversed as the active "divisor." Thus, in division the implicit *quantizing*, set-generating factor of the pre-rational numbers has been removed, opening up the omni-non of the continuum to the mathematical ratio operating on the immanent-transcendent axis. See Figure 33, below.

[i]* See, Four-Dimensionality: Trans-Biased vs. Immanent/Transcendent, p352.

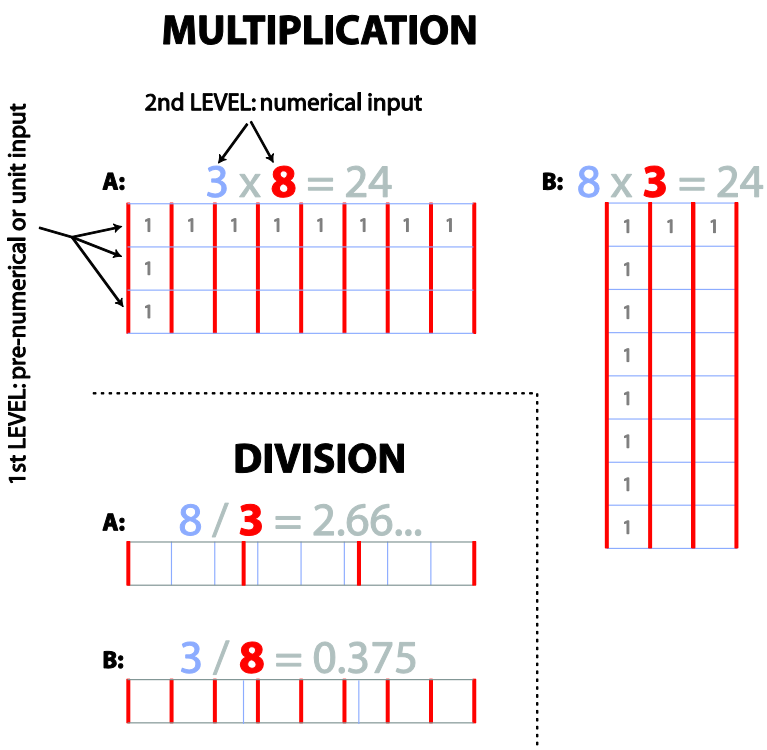

Figure 33: Multiplication/Division Commutativity and the Breaking of Unit Closure: MULTIPLICATION: Comparing A and B we can see commutativity as simply a different orientation of the same resultant rectangular area. DIVISION: In division, commutativity is absent, because the order of input determines the direction of a process of unit-scale remapping. The dividend (thin blue lines) retains the implicit input scale and the divisor (thick red lines) then remaps itself as a whole to the dividend and their respective implicit unit-identities are compared. This ratio can be seen visually by assessing how much of the passive-dividend's blue squares are present in one of the active-divisor's red boundaries.

Because the ratio opens up the implicit input of the enfolded unit-identical 1st level to the infinite variability of the numerical identities (digits), the ratio begins operation on the VL-axis of scale, the uncountable I/T axis from which the unit-scale was implicitly defined in the first place. In division, as we can see in Figure 33 above, commutativity is absent because the order of input determines the direction of a process of unit-scale remapping (our expanding/contracting holonic solidus/vinculum, below). The divided number, the numerator or dividend (thin blue lines), retains the implicit default input scale and the active frame of reference of the value of the number itself, and the divisor (thick red lines) then remaps itself as a

transcended-and-included whole to the dividend. At this point their respective implicit unit-identities are compared giving us the function of the ratio, breaking the closure of the unit-identity itself.

This ratio can be seen visually by assessing how much of the passive-dividend's blue squares are present in one of the active-divisor's red boundaries. The ratio ultimately compares the different sizes of the respective scale-defining unit-identities (breaking the implicit identity of units) of each numerical input, after the initial remapping takes place. If the divisor and dividend are the same value then the remapping will be no different than the original implicit input scale of the unit-identity and we are back at unity; one.

This unit-closure-defying scale-remapping is what makes division non-commutative, because it is dependent on the direction of the implicit, default input-scale and explicit expanding/contracting output-scale in its scale-remapping procedure. Multiplication, on the other hand, involves no unit-scale remapping procedure (and no possible breaking of unit-closure), because the unit-scale of 1 (and its pre-numerical closure) is taken agglomeratively as the transcended-and-included implicit input-unit and not opened up to the infinite variability of the numerical identities.

Recursion, Iopol, Violation of Closure and the Acategorical Imperative

As we are beginning to see, the trans-trans-bias inherent in the linearity of operations, along with our levels of recursion and the input/output polarity, imparts a fascinating property on the transcending-and-including embryogenesis of number. At the first- or unit-level of recursion, the transition from the agglomerative, trans-biased Natural numbers to the integers—i.e. the violation of the closure property of the naturals—took place through the inversion of the input-output polarity. At the next level of recursion, in the transition from the integers to the rationals, we began again with the agglomerative default of second- or numerical-level recursion in multiplication and it was again the inversion of the input/output polarity in division which violated the closure property of the integers—and the unit-closure shared by all pre-rational numerical identities.

This violation of closure at the transition from the integers to the Rationals is of such importance in mathematics that it is often called simply the "violation of the closure property" itself, and this is because it violates the *unit-closure*, and *pulverizes* the fundamental *category* of mathematics, the unit-identity (and the *agglomerative* numerical-identities or the integers) that began the holarchical embryogenesis of number and operation in the first place. In so doing it opens up mathematics to the Nagarjunan logical-Emptiness implicit in the nondual view of rationalism; e.g. there are different Rational numbers so inconceivably close to each other in value, in

comparison to any two integers, that they "appear" identical in all practical applications, but beneath appearances they have a singular difference. Thus again we can see a direct correspondence between rationality in mathematics and rational philosophy, metaphysics, epistemology and ontology. The rational level in all of them operates on our I/T axis and its category-pulverizing, re-mapping *acategorical imperative*, breaking beyond the rigid distinctions of the numerical identities and opening up to the infinite difference within.[i]*

We can see in this iopol reversal, then, a sort of ratcheting, back-and-forth saw-tooth kind of cycle in our transcending-and-including holarchy and embryogenesis of identity (number) and operation. Every time we break the initial agglomerative bias of the transitive mapping of transcendence,[ii]* and invert the implicit order of input and output, we move to the next level of the holarchy.

This implicit polarity and trans-bias of input and output can be seen very clearly in the asymmetry of the fact that it is easier to multiply than to divide.[iii] The Babylonians, for example, compiled tables of division answers in the form of *1/n* for *n* integers, for the simple reason that division is much more difficult to do on the fly than multiplication.[iv¥] Multiplication/division is asymmetric with respect to unit-closure. Multiplication recursively and holarchically builds upon initial unit-closure, and division breaks it open in the iopol reversal. This polar level of identity and operation exists between the two 'orthogonal' axes—the transitivity of multiplication (with its recursive expansion of the unit- and numerical-identities) and immanent/transcendent (with its pulverization of numerical identity into the intensive forces).

The division of the unit-number into the rational or fractional set, reminds us that division of the immanent axis, from a unity into a polarity, the within and without, is the first operation of mathematics in the setting of the unit-magnitude. Just as in the Triune Infinite, the modal infinity is the interface between the I/T and transitive axes, so too division and multiplication function as a map (relational system of application) between the transitive and I/T axes. Provided that the operational magnitudes are greater than the unit number and the ratios result in clean integers, the

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[i]* See, Nondual Rational-Empiricism and the Acategorical Imperative, p62.

[ii]* See, The Image of the Trans-Trans-Bias, p312.

[iii] It may also be seen, in another way, in function offsets, with the asymmetry between the offsets of input (x) and output (y). For example, take the function x + y = 6; offsets made to the input parameter, x, such as plugging (x+3) into x, shift the graph in the *negative* direction—minus 3 units on the x-axis—whereas those on the y (output) axis, shift it in the positive direction. This asymmetry is a function of seeing one direction (trans-trans), from implicit input (recall our hidden realm of input unit-identities used to subtract from in the process of addition) to explicit output, in the implicit polarity of input and output.

[iv¥] Bell, Development of Mathematics, p. 31

immanent actions of multiplication and division operate purely in relation to the transitive, implicitly unit-quantized scale. But once the division ratio differs from the unit-number or its multiples, it begins to operate in relation to the infinite immanence (yin) inherent in the operation of division. For this reason it is important to have the immanent axis in mind when dealing with multiplication and division.

We find a physical correlation with the following quote from Lebau:

> On all macroscopic levels quantity is an absolute dimension. [...] For sub-atomic particles, however, identity begins to intermix. Portions of material enter into and out of the system designated as "particle." When identity begins to be lost, quantity becomes relative. As we shall see, here is the real indeterminacy in nature.

Similarly, when we divide past unit-identity we break the trans-biased unit-closure of holarchical recursive agglomeration and enter into infinite immanence as though we might search to redefine the unit-scale. This immanent infinity gives rise to the infinities between all finite numbers on the continuous or rational number-line. It is the land of the undefined logical-Emptiness that must be mapped in terms of the defined, and thus we find the Rational numbers and the "Decimal expansions," operating upon the new I/T axis yet expanding from either direction in relation to, transcending-and-including, the transitive axis of integers.

The Ratio and the Expanding/Contracting Holonic Solidus

We have already discovered the working elements of the holonic solidus/vinculum above,[i]* and also in the section on The "Labyrinth of the Continuum" and the Principle of Nondual Rationalism (p73). Indeed, it was instrumental for providing us with the central chord of our Ariadne's cable, the Principle of Nondual Rationalism guiding us through Leibniz's labyrinth. Recall also, at this point, from the same section, the analogy of the ratio as an intrinsically balanced seesaw. And recall also that it is the transcendent-bias implicit in the iopol or distinction of numerator and denominator that inherently offsets the balance toward transcendence in the numerator—with its transcended-and-included default unit-scale—and immanence in the denominator—with its expanding/contracting scale opened up in the iopol of division, giving us in the end the transcendent-biased definition of the rational number.

[i]* See, Multiplication Through Division, p324.

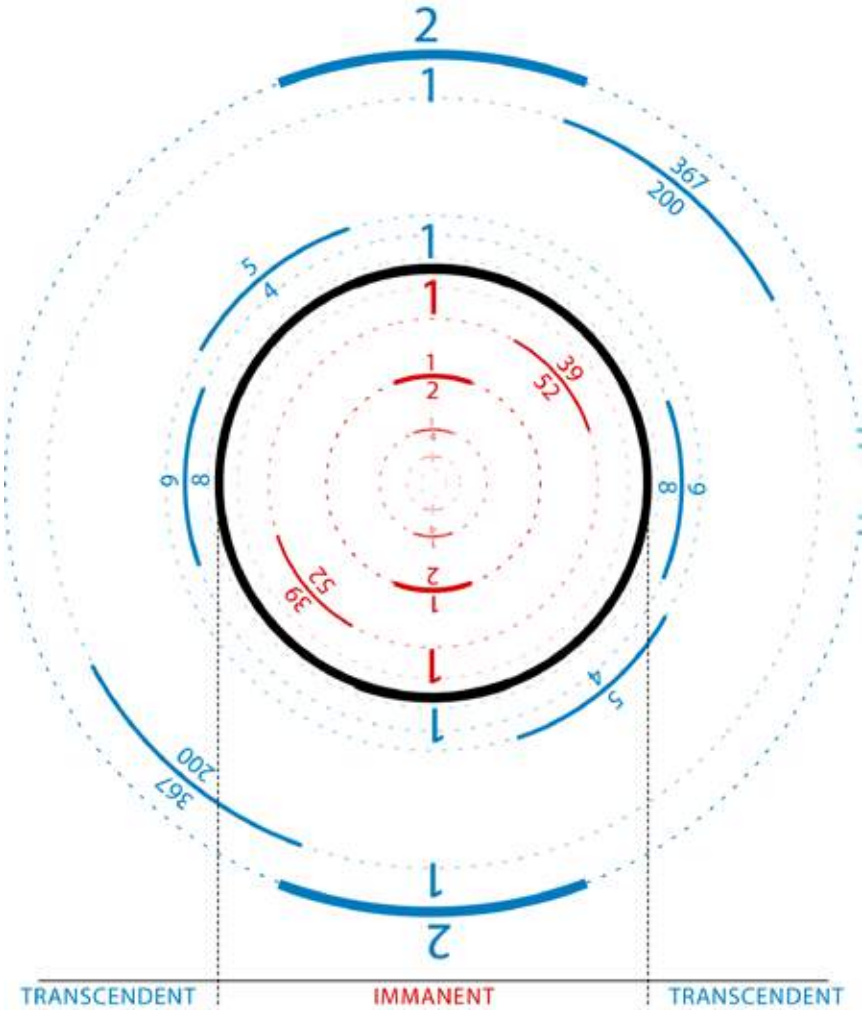
With the implicit first-level input of the unit-identity as divisor now taken over by the explicit use of any second-level numerical identity or number, the expanding/contracting solidus or vinculum now represents the unit boundary of the rational number system, operating upon (abstracting aspects of) the implicit continuity of the *a priori* uncountable I/T axis. Seemingly, this boundary can take any size at all, but due to Dedekind, we recognize that the Rational numbers do not indeed abstract out this entire boundless (Emptiness) aspect of immanence and continuity.

To understand very simply the nature of the fraction, so we might see its limits, and the limits of the rational numbers, visualize the solidus-lever as a circle. Putting weight on the inside of this boundary, the denominator, pulls the boundary in the immanent direction, towards contraction or reduction of intensity, whereas putting weight on the outside, the denominator, pulls it in the transcendent direction, moving it toward expansion and increase of intensity due to the transcendent and objective (outward) bias.

Naturally it is intuitive that in this imagined motion the boundary of the ratio between the two infinities of immanence and transcendence can reach all *points* of the continuity within. But given that, for the rational numbers, only finite unit-multiples can be compared in the ratio, thus ultimately only *finalized* jumps can ever be enacted, presenting intrinsic operational limits (e.g. Dedekind cuts) to the Rational numbers as a whole. The irrational numbers, on the other hand—opened up through the iopol-reversal of the next level of roots—deal with the never-ending infinities of immanence themselves, instead of coming to rest on a final point and number.

This distinction between the infinite and finite nature of irrational vs. rational numbers, respectively, may be the ultimate difference here in this respect. Dedekind cuts themselves are not actually *gaps* in the continuity, but merely "infinitely small" points where two lines cross (one of which is the numberline) and a rational number cannot be found there. Is an "infinitely small" division, a division at all? Not according to our fundamental principle of Nondual Rationalism which says that infinite division equals indivisibility. An infinitely small division presents a gap of zero size, taking out zero amount of continuity. Given that an "infinitely small" or extensionless point, in Nondual Rationalism, is merely an "immanent-local" *aspect* of The Infinite, and given that a Dedekind cut is not, therefore, a gap in continuity, it may indeed at the same be true that the rational numberline is indeed continuous—as would be expected given the infinities on either side of the ratio—but also that the rational numberline is incomplete with respect to those points that don't come to rest on a finalized rational number, but keep going right into the immanent infinity itself, as we will see.[i]*

[i]* See, The Trans-Rationality of the Irrational Numbers, p365.



Repeated from Figure 1 (p83): The Expanding/Contracting Holonic Solidus/Vinculum:

Above the unit-***solid***us—and operating in the transitive-transcendent layers in the embryogenesis of mathematics—things are just that, solid. We can add, subtract, multiply and divide in terms of unit amounts, with a bit spilled over here and there. We can reduce fractions above the unit-solidus to compound agglomerative numbers, e.g. 2/1 becomes 2*1 = 2, etc. When we

break below or between the unit-solidus, however, we abandon the transitive grid, axis and holarchy of agglomerative number functions and enter the no-man's-land of the raw immanent infinite inherent in continuity.

We can see this new VL-axis clearly where we find parentheses in interval notation, e.g. *[16, 8)*, this is where the transitive breaks into the immanent aspect of The Infinite and the labyrinth of the continuum.

The Rational and the Deleuzian Intensive Forces

We can see, then, that the ratio and the expanding/contracting solidus/vinculum is the mathematical (pure-relational) analog of the Deleuzian intensive forces. Inherent in this polarity is a positive infinity, what Deleuze calls the "secret of the rational." Rational numbers only inherit a negative sign through transcending-and-including negative integers with their intrinsic "oppositional forces."

We can also tell that the rational level works on a new VL-axis by its inverses. The rational inverse is a reciprocal, flipping across the solidus and never changing the sign. The additive inverse, on the other hand, always and merely *is* a change of sign. These terms and inverses of each level endlessly "approach" different limits. For the additive it is the negative and positive axis of the integers, and for the rational it is zero and infinity. The negative signs that can occur in Rational numbers get there by being transcended-and-included from the additive layer. Because the negative sign, and negativity or opposition in general is not native to the I/T axis of the rational (Deleuze's positive infinity) its transcension-and-inclusion in the default pre-rational Cartesian/Euclidean rectilinear geometrical model—which can't accommodate more than three dimensions—generates the non-modelable transitive axis and vestigial 4^{th} dimension of the imaginary numbers.

The Absolute Value and the Intensive Forces

With the trans-trans identity and its distinctive identity-line in mind, it is instructive and valuable to point out the transitive mapping of the intensive forces in terms of absolute value. When the Rational numbers are mapped in terms of their intrinsic, agglomerative "positive" value—the intensive forces transcended-and-included with the unit-closure itself—we find the distinctive graph of absolute value. See Figure 34, below. Absolute value, then, in a sense takes us back to the intensive forces and polarity of addition and the transitive-axis, truncating the negative forces of subtraction, but only on the multiplicative y-axis opened up with the doubling recursion of the layer of multiplication in the holarchy and EOTC of mathematics.

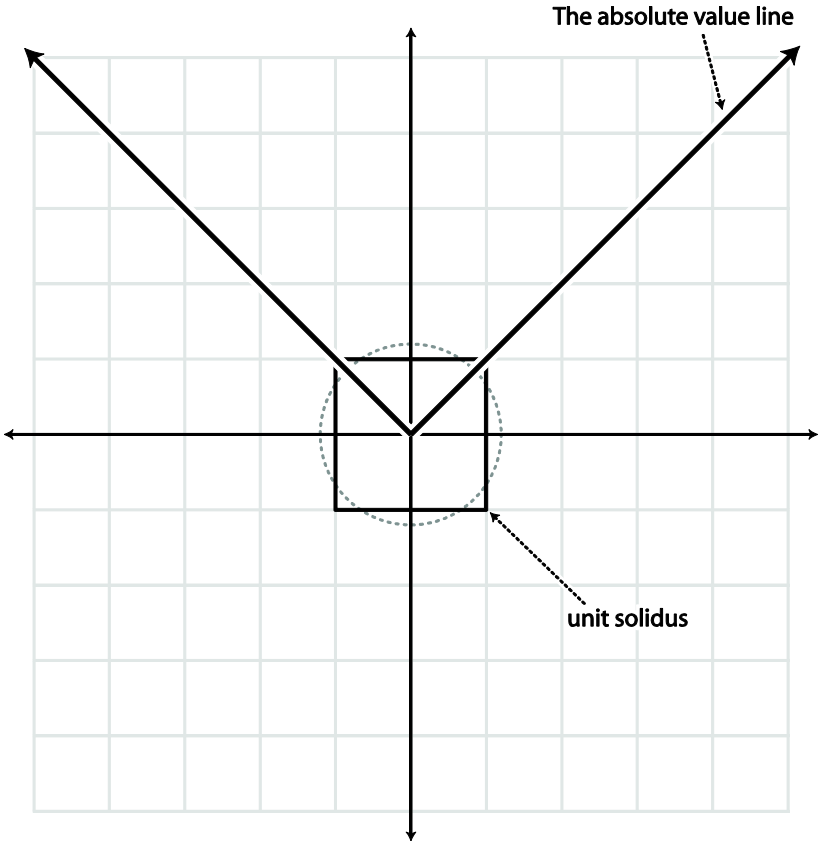


Figure 34: The Image of Absolute Value (or the absolutely valuable image):
The function of absolute value truncates the multiplicative plane into the intensive forces transcended-and-included tacitly with the unit-identity, and explicitly with the move into the Rational numbers and the new origin and identity of the multiplicative.

The Polarity of Zero: The Amphibian of the Transitive and Immanent

> *[zero]...a fine and wonderful refuge of the divine spirit—*
> *almost an amphibian between being and non-being. —*
> Gottfried Leibniz

Zero, or the cipher, as we can already see, denotes at least two different meanings in mathematics. It has an inherently binary nature due to the fact that there are two fundamental or pre-operational VL-axes underlying

mathematics; the transitive and the immanent-transcendent. But each of the two aspects of zero also corresponds to a different set of numbers generated with these pre-rational "agglomerative/deglomerative" operations. On the I/T axis, placed in the immanent position of the ratio (the denominator), zero inverts to its identical opposite, the transcendent pole of the I/T axis. This "rational zero" is the infinite immanent pole, the singularity implicit in any finite unity or being.[i]*

On the *transitive* axis, however, zero (transitive zero) is the absence, negation or non-being of a unit or compound number (through the iopol inversion), as we have seen. It can be reached simply by subtracting a number from itself in relation to others. In this way, the immanent and transcendent (i.e. rational and pre-rational) views of the function of zero give us Leibniz's amphibious nature of zero as both the very essence and the very absence of being.

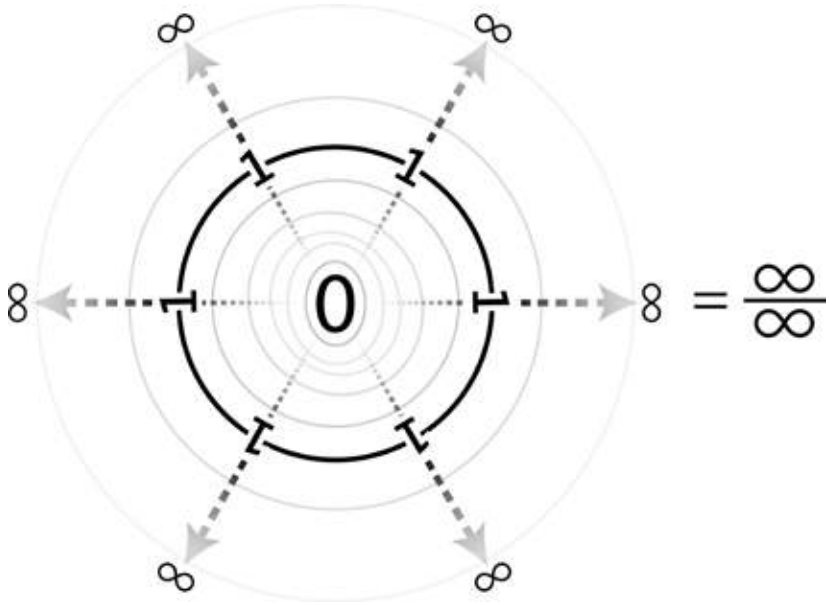


Figure 35: Immanent Zero:
Immanent zero as the infinite pole of immanence on the immanent-transcendent axis.

Here we can see the difference between the immanent/transcendent and additive (transitive) identities in light of the differences in transitive and

[i]* Recall The (Binary) Cycle of Unity (p254), and the interface of the I/T uni-axis of the ONE-one.

immanent zero. On the I/T axis, zero is the identical-inverse of infinity. This is what we will call "immanent zero." Neither immanent zero nor transcendent infinity represent boundaries, or real points, so neither are numbers, in themselves, though irrational numbers, as bounded infinities, can directly involve them.

With infinite volumetric extension again inherent and enfolded in the definition of magnitude and primitive number itself—and thus accompanying all instantiations or ideas of quantitative value, especially concerning PHYSICAL parameters—there can be no more "infinitely small" point-particles to draw us into the *labyrinth of the continuum*, or into Zeno's infinite regress of representational measurement, only to be empirically "renormalized" later into the finite, volumetric- or extension-derived physical constants of particle physics. Had this seemingly obvious meta-mathematical observation been understood by the particle physicists of the twentieth century, the point-particle mistake, and its extension to the superstrings extruded therefrom in "zero-thickness," would have been a no-brainer. The extensionless point—as the implicit singularity of an immanent/transcendent uni-axis or as the positional aspect of The Infinite—can only denote position (a 'terminus,' as Leibniz called it), after the fact, not physical extent or magnitude. Continuity and Infinite Unity is not composed of immanent infinities, but they are abstracted out of it as positional aspects. No surprise there, considering our principle of absolute reversal, that the unwitting input of an immanent infinity (implicit singularity) ends in the output of transcendent mathematical infinities (explicit singularities).

If that "thing" or property, operated upon as if it were finite or relative, is tacitly defined in any of its properties as infinite, or absolute—such as an "infinitely small" point—then an operational error has occurred in the Univocity Framework at which point the principle of absolute reversal will come into play. This absolutizing of the relative is a fundamental-level con-fusion between polar opposites of finite and relative modification vs. the infinite and omni-local absolute scope. Infinity and immanent zero, as the limitless limit for division, are such aspects of the absolute scope and by definition and scope they cannot be surpassed in their kind.

Immanent zero, conceived as a limit, is instantaneously squeezed out of transitive extension by the categorical realization that "zero-size" is absolutized into an oxymoron and, like "absolute nothingness," it is a self-negating concept. Thus the immanent "zero" behind every infinite division becomes the abstract inward pole of the infinite immanent axis beyond transitive extension and numeration. It is the inverse of "infinite in extent" so we call it the "inverse infinite" or "immanent zero." And as a pole of an infinite polarity or VL-axis, it is absolutely un-reachable and boundless.

On the immanent axis, there is no *absolute* "approaching the limit" as ambiguously undifferentiated in the calculus.[i]* Such approaches are *always*, and *only* relative to the transitive scale of the default pre-rational, transcendent-biased Cartesian grid.[ii]* The curve may appear to get steeper and closer to the limit, relative to the transitive frame of reference (the graph), but in parameter-space a simple scale function (operating on the I/T axis, of course) brings it right back where it started, if desired, no closer and no further from the non-limit at zero. The "approach" is but a perspectival illusion, a figment of mathematical imagination (meta-mathematics). Though this is well known and even intuitive in mathematics—given that it is not encoded in the modern orthodox mathematical framework, which currently lacks the I/T axis and Vision-Logic Coordinate System—it is easily and often forgotten under normal meta-mathematical operations. Its reiteration here is crucial, however, to the concept of "immanent zero."

The Orthogonality of Inverses and the Offset Origin-Identities

The initial orthogonal distinction between the transitive and I/T axes—and their respective operations of addition/subtraction and multiplication/division—perhaps finds its most lucid illustration in the comparison and contrast between the additive and multiplicative inverses and their respective identities. This clarity demonstrates the validity of the assignments of addition/subtraction and multiplication/division to their respective transitive and immanent/transcendent axes.

At this point there is some potential con-fusion that must be averted with the different meanings of the term "identity". Identities, used in conjunction with the operations—e.g. additive and multiplicative identities—are effectively nulls with respect to that operation. They are the numbers that leave no effect on the operation itself, but *return the identity* of the other input number; e.g. $3 + 0 = 3$ or $3 \times 1 = 3$. So we have here a distinction between ***categorical*** identities (e.g. the unit and numerical identities) and ***operational*** identities (e.g. the multiplicative and additive identities). The operational identities return the categorical identities in any operation.

The additive inverse of any number is its negative or inverse-identical (e.g. x and $-x$). But the inversion of addition *ultimately* operates through the subtraction, *from zero* (the additive operational-identity and implicit origin of the transitive-axis), of its numerical-identical (i.e. $\boldsymbol{3}$ and $0 - \boldsymbol{3}$). This inversion process, for the transitive axis, operates symmetrically about

[i]* See, Reconnecting the Lost Thread of Mathematical Rationalism: Spinoza, Leibniz, Immanence and the Calculus, p400

[ii]* See, The Image of the Trans-Trans-Bias, p312.

zero—the additive operational-identity—on the integer number-line. Similarly, the multiplicative/division inverses operate with respect to the multiplicative operational-identity, 1, the unit-identity hidden under the implicit solidus of every integer; i.e. 8/1 inverted to 1/8. In contrast to the additive inverses, however, the symmetrical and opposite operations of multiplication/division do not and cannot, of themselves, generate negative numbers—they are *intensive*, not oppositional forces.

The rational inverse is a reciprocal, *flipping across the solidus* and never changing the transitive sign. The additive inverse, on the other hand, always and only is a change of sign centered on zero. So we see that the transitive-axis and its specific operation-layer of addition/subtraction is centered on *zero* (the additive operational-identity, or null) and the I/T axis' multiplication/division (mult/div) layer is centered on *one* (the multiplicative operational-identity or null). ***The origins of each of the operational VL-axes are centered on their respective operational-identities, thus we can also call the operational-identities "origin-identities" to emphasize this relation.*** And so, we have *zero* and *one* as the origin-identities of the *transitive* and *I/T* axes, respectively. (See Figure 36, below.)

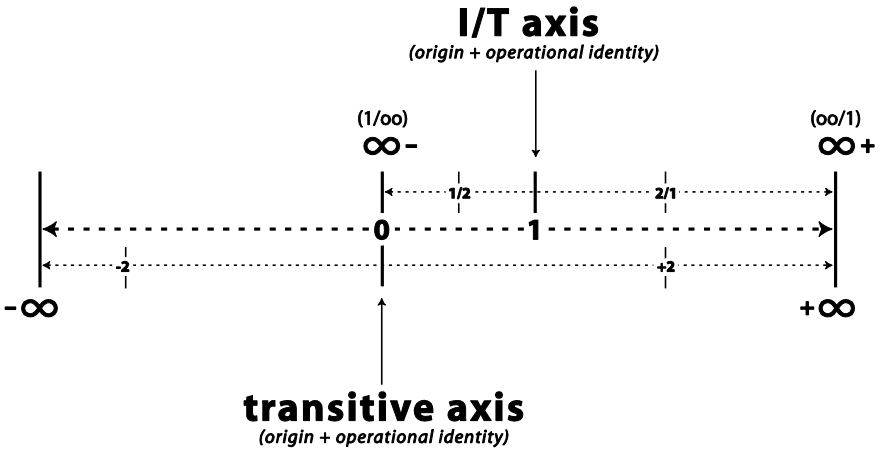


Figure 36: The Map of the Origin-Identities:
The offset origins of the I/T and transitive-axes and their respective operational-identities of multiplication/division and addition/subtraction. The additive identity and origin of the transitive-axis is zero and the multiplicative identity and origin of the I/T axis is one.

These terms and inverses of each level not only have different intrinsic origin points, but they limitlessly "approach" different intrinsic "limits" on either end of their respective number-line axes. For the additive, the limits in the unlimited are the negative and positive transitive infinities ("unboundaries") of the integers, and for the rational it is immanent-zero and the positive infinity of transcendence.[i]

The negative and positive (oppositional) signs that can occur in rational and multiplicative numbers, as we have seen, get there by being transcended-and-included from the additive and transitive layer. Because the negative sign, and negativity, or opposition in general, is not native to the I/T axis of the rational (again we see the correlation with Deleuze's intensive forces of univocity)—but even more critically because the I/T axis itself is not fully operational in mathematics—the transcension-and-inclusion of the transitive-axis at the higher level of powers and roots generates the non-operational, non-modelable and non-conceptual transitive axis of the imaginary numbers, in the pre-rational context of the Cartesian/Euclidean rectilinear default geometrical model for numeration, as we will see in more depth below.

The Kernel of the Trans-Trans Asymmetry and Instability at the Crossroads of the Transitive and I/T Axes

Note that the addition of *like* signs *always* results in a number of that same sign, leading further in the *agglomerative* direction of *either* the negative or positive transitive infinity (e.g. *-3 + -3 = -6* and *3 + 3 = 6*), rather than deglomeration toward the additive origin-identity at zero from either oppositional direction. Note as well that with the addition of *different* signs it is the number with the *greater absolute value* that determines the sign of the result (e.g. *3 + -6 = -3*).

With multiplication as a *recursive* addition/subtraction, however, there is an *apparent* non-intuitive shift away from this straightforward agglomerative operation. Unlike addition/subtraction, multiplication of *like* signs (whether positive or negative) *always* leads to a *positive* number, while multiplication of *unlike* signs *always* leads to a negative. This is not because multiplication is *fundamentally* different from addition, but because multiplication is actually a new emergent layer, operating at the higher (transcended-and-included) level of recursion, as an automated, or *doubled* form of addition/subtraction. For example, take the equation, *-3 x -3*. In

[i] Note that here we again see the overlap of the positive transitive and transcendent infinities in the default trans-trans bias as seen explicitly in the identity line. See, The Image of the Trans-Trans-Bias, p312.

additive terms we start with zero—the additive operational-identity and origin—and begin the low-level iteration resulting in … *0 - -3 - -3 - -3*. Recall that subtracting a negative number is the same as adding a positive number, which would translate to … *0 + 3 + 3 + 3 = 9*.

With this shift toward the critical distinction of resultant sign being a function of likeness vs. opposition—i.e. like signs result in positive answers, and unlike result in negative—it is difficult to escape the conclusion, once again, that the rational/multiplicative operational layer is operating now on the intensive and inter-expressive forces of immanence and its I/T polarity and axis. Further, the rational layer is, in a sense, oscillating between the transitive and Immanent/Transcendent axis, as seen in the graphs of this instability as it manifests in the radical distinction between the axes and polarities of even and odd integers in the exponents of ascending powers (See Figure 38, The Trans-Trans Asymmetry and Instability, below, p347).

This seemingly innocuous fact about the second-level of recursion in multiplication, however—with its *identical* answers for inversely charged statements (e.g. *-3 x -3 =* ***9*** and *3 x 3 =* ***9***)—leads to a fascinating critical instability and ambiguity by the time we get to the next level of recursion in powers and roots. This ambiguity leads ultimately *through* the square-root property and *to* the phenomenon of "imaginary numbers," as Descartes called them. We'll explore this in more detail below.

PHASE FIVE: THE TRANS-RATIONAL AS SECOND TIER

I/T Powering and Rooting: Unfolding the Onion of Operations

In the embryogenesis of number and operation, at the level of rooting and powering, we find yet another transcended-and-included layer of agglomerative recursion. The difference at this level is simply that powering has transcended-and-*included* the iterative-addition function of multiplication to give us the iterative-multiplication, or (2nd level) *iterative-iterative*-addition function of powering. This holarchical level in the art and science of pure-relation brings us into the domain of physical forces, all of which are modeled by power/root functions such as the fall-off of forces as a function of the distance or radius *squared*. But most importantly, with this level, the uncountable infinity of the I/T axis has begun to be tapped, with the iopol reversal into specific roots, for example.

As would be expected, powers are agglomerative, synthetic and transcending while roots are deglomerative, analytic and immanent or descending (or "positive" vs. "negative" in trans-biased terms). Both are meta-functions on the uncountable I/T axis and through their exponent-notation they reference the origin-identities, VL-axes, rules and polarities of each of the deeper levels—the unit-solidus origin-identity, axis and I/T polarity of multiplication/division, as well as the transitive sign-rules and polarity enfolded at the deeper level of the countable infinities of addition/subtraction. Indeed, this is what is so distinctive about the power/root level. It is the first level in which all the previous levels are in explicit, integrated operation. See Figure 37, below.

Interestingly, this function of the trans-rational operation of powering and rooting mirrors the function of the "trans-rational" and "integral" level of development in integral philosophy. This level in integral philosophy is called "second tier" because it can finally begin to recognize the truths of the deeper levels, explicitly transcending-and-including them positively, rather than transcending-and-negating them as with the forces of opposition characteristic of the pre-rational and pre-integral. At this integral or second-tier level one can descend and operate at each level at will without negating the power and function of each. Similarly, in powering and rooting, the transcended-and-included operations of the previous levels—addition/subtraction and multiplication/division—manifest explicitly in the nested polarities of the rules of exponents, laying bare to manipulation the

whole transcended-and-included holarchy of identities and operations—but this only occurs when we get to the level of powers and roots.

In powers and roots, and their exponential notation, the signs of the transcended-and-included polarities of the exponents (+ and - for addition-subtraction, and the solidus/vinculum, for mult-div) mediate the polarities of the next level, for the base. The exponent is, in a sense, an operator, control or manipulator whose enfolded operational polarities are offset—in relation to its base—at a higher level in the holarchy of number and operation; i.e. polarity-inversion operations on the enfolded VL-axes of the exponent (e.g. transitive-***sign*** and I/T-***solidus*** inversions) ultimately mediate the operational polarities of the base at the next level up. For example, changing the *transitive* sign (+ -) of the exponent, flips the *I/T* mult-div polarity of the base across its *solidus*; e.g. $b^{-x} = 1/b^{x}$. Similarly, flipping the *exponent* across its solidus, inverts the *power/root* polarity of the *base*; e.g. $b^{1/x} = \sqrt[x]{b}$ (see Figure 37, below).

Therefore, encoded in the operation of the power/root level, for the first time, is the entire transcended-and-included holarchy of number and operation, *finally* made explicit in the sign-rules of exponents. This is our familiar "ontogeny recapitulates phylogeny," Haeckel's "Biogenetic Law," which is a natural feature of *any* transcend-and-include embryogenesis … of concept or of crocodile.

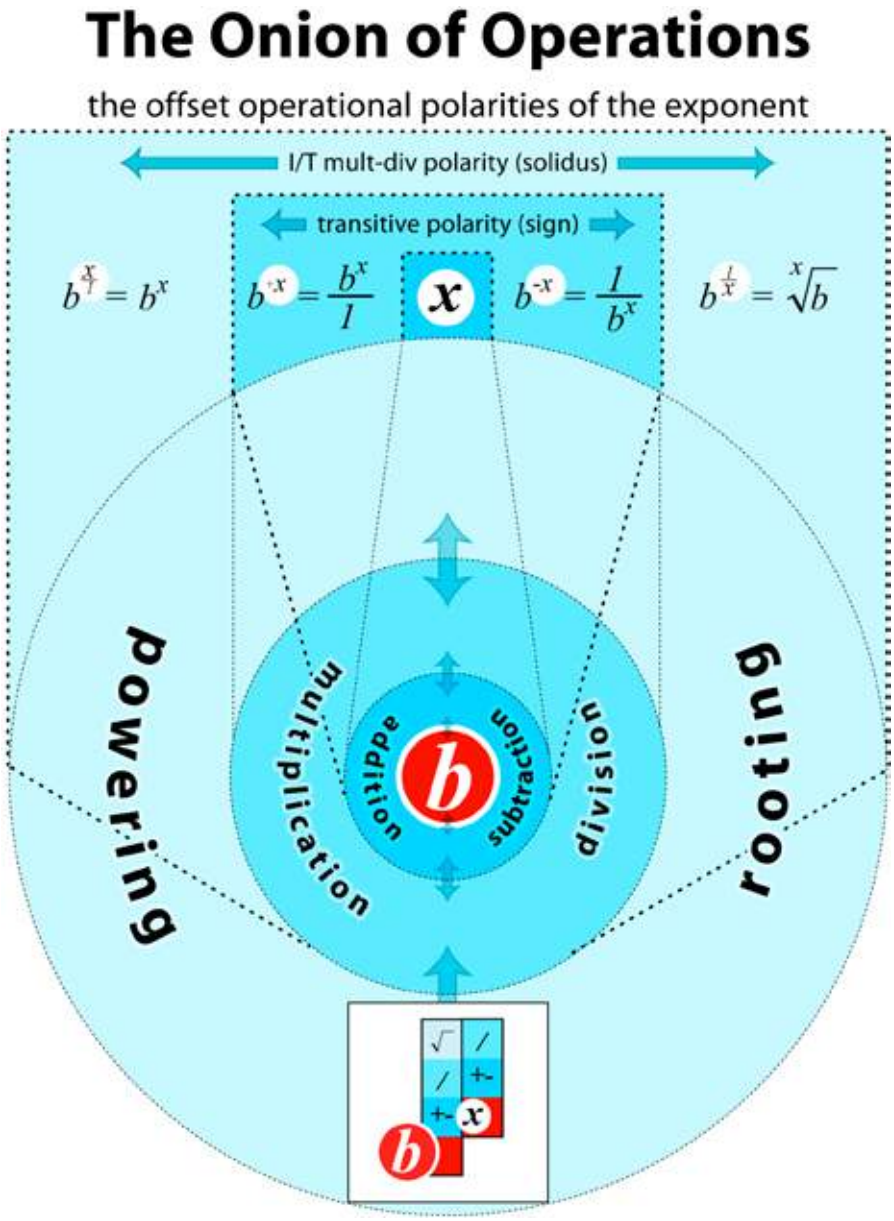


Figure 37: The Onion of Operations:
In the exponents of powers and roots the entire transcended-and-included holarchy of operations is finally made explicitly operational. The input/output polarity of each transcended-and-included level of operations, in the exponent, acts to mediate the polarity of the next higher level, for the base. For example changing the transitive sign of the exponent flips the entire number (and its base) around the unit-solidus, the origin of the I/T axis and the level of mult-div. So too, changing the position of the exponent across its own unit-solidus flips the polarity of the next higher transcended-and-included level of operations for the base, inverting it across the power/root polarity.

The mult/div level is the interface between the transitive add/subtract level and the immanent/transcendent power/root level. In a sense, while mult/div held one agglomerative foot (mult) on the trans-trans identity axis and the other foot (div) slipped into the hidden immanent uncountable infinity of the I/T axis, not operationalized on the default pre-rational Cartesian graph, roots and powers operate fully on the I/T axis. This is seen in the fact that multiplication can *modelably* operate on the negative transitive numbers while such operation at the levels of powers and roots leads to the ambiguity of the square-root property and ultimately to the *unmodelable* axis of the "imaginary numbers." It takes the second-order recursion of powers and roots to reveal the instability at the heart of the mult/div level as seen in the numerical-identity and ambiguity between multiplying numbers of like signs (either positive or negative).[i]*

Furthermore, this operation of the root/power level upon the I/T axis is also seen in the graphs of powers and roots in that they can never line up exactly with the trans-trans identity line (unless their power is strictly that of the additive/multiplicative levels, i.e. 1), but can only approach it, being fundamentally non- or trans-linear. In this sense as well, the first power of the exponent is the representation of the implicit unit-closure transcended-and-included at the power/root level. The unit-closure is also seen in the fact that all numbers *other than 0* taken to the power 0 are found to be 1. There is a unique place for both zero and one at the power/root level. This is the transcension-and-inclusion of the previous origin-identities seen in the fact that all power and root functions of the form $y = x^n$—which have not transcended-and-included any transitive x or y off-sets—must pass through both zero and one (for both x and y), our transitive and I/T origin-identities, respectively. See Figure 38, below.

The instability between the oppositional forces of the default transitive and the new intensive forces of the I/T is made manifest with the automated recursion of multiplication in the power functions. And we can see the oppositional transitive-axis itself and its integers, standing out in the context of the rational and its intensive forces in the instability of the powers in Figure 38, below.

[i]* See, The Kernel of the Trans-Trans Asymmetry and Instability at the Crossroads of the Transitive and I/T Axes, p340.

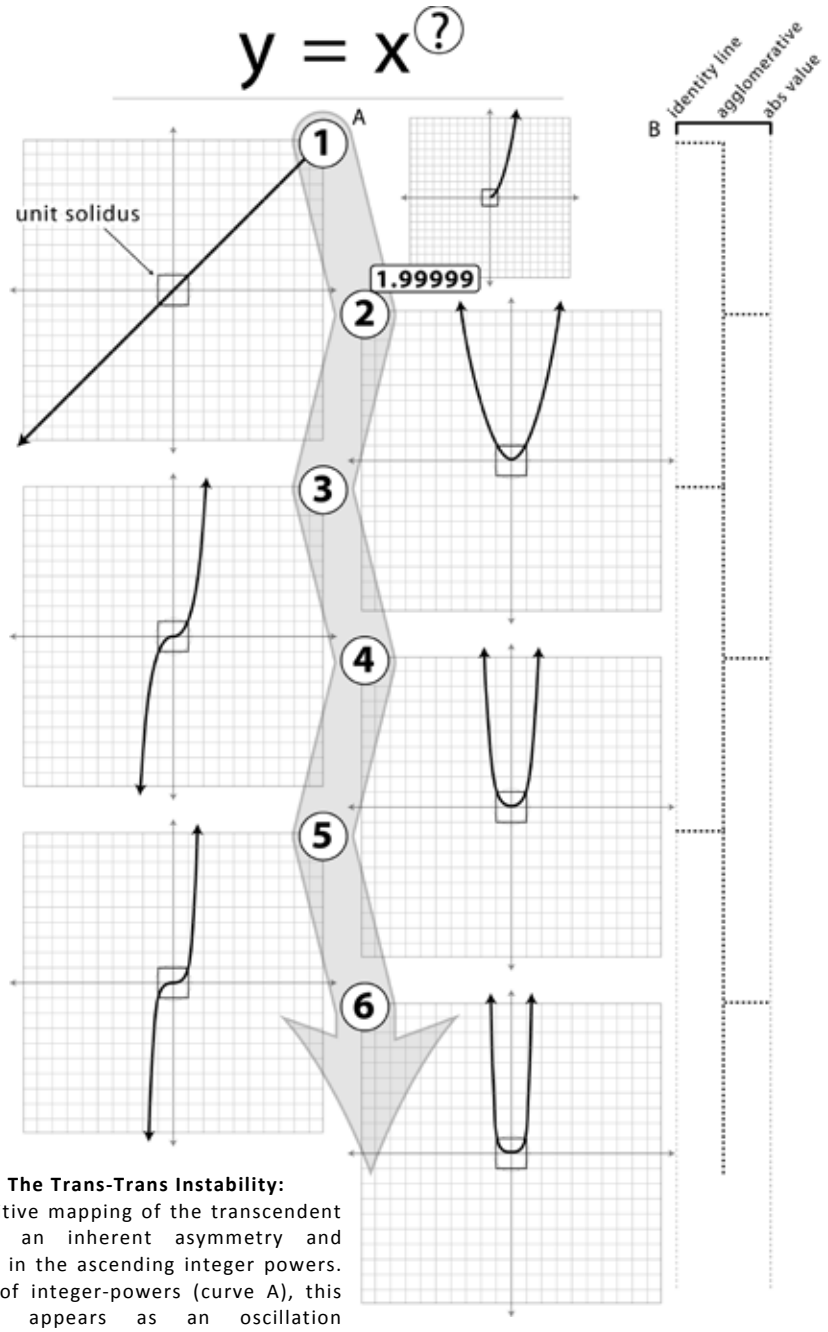


Figure 38: The Trans-Trans Instability:
The transitive mapping of the transcendent generates an inherent asymmetry and instability in the ascending integer powers. In terms of integer-powers (curve A), this instability appears as an oscillation between the even and odd powers, but on the *rational* number-line of powers (curve B), there is an infinite bias in graphs of powers toward the intensive forces of pure agglomeration or absolute value.

Note that with the powers, and thus with multiplication itself, there is an effectively infinite favoring of positive, or intensive forces, as opposed to the negative and oppositional. This is seen in the fact that *only with the exact integer values* of the ***odd*** powers do we see the recurrence of the transitive identity line between the positive and negative infinity of the pre-rational. In even-integer powers (ultimately meaning multiplication by *like* signs, or multiples thereof), the trans-trans identity is truncated to the absolute value of the multiplicative (*y*) axis and mapped in a mirror image, rather than in the directionality of the identity axis. On the graph, the curves of the *rational* values infinitely approaching the integer powers appear identical. For example, the graph of $x^{1.99999}$ appears nearly identical to that of $x^{2.00001}$ and since they aren't integers, they map exclusively in the purely agglomerative or *intensive* upper-right quadrant.[i]

In other words, in a *purely* random search through the deep infinity of the space of graphs of powers with *rational* exponents, it is virtually infinitely improbable that you will stumble upon one that maps to an integer power and displays the trans-biased identity axis or directionality between the upper-right and lower-left quadrants. In this way, curve B in the diagram below is still infinitely misleading in that the horizontal lines are infinitely thicker than the actual "infinitely thin" or "zero-dimensional" lines that they represent.

The reason that non-integer powers of negative *x* do not show up on the graph, however, is that they involve a mixture of powers *and roots*; or transitive/agglomerative and immanent/transcendent functionality. The forces of immanence, remember, are forces of intensity, rather than opposition, and it was the first move onto the I/T axis in the ratio which pulverized the unit-identity transcended-and-included in the integers, bringing us intrinsically to the forces of intensity of the rational. So it is ultimately because the rational number-line is operating on the intensive axis of immanence and transcendence that rational roots only appear in the upper-right intensive quadrant.

Take, for example, the value of 2.5 in the exponent. This is actually a combination of 2 and ½. We have seen that in the exponent the rational polarity of the solidus is mapped to the next higher operational polarity, the roots and powers, for the base. And so the rational exponent of ½ is actually the root 2 of *x*, or the *square root* of *x*. Given the positive-negative ambiguity of multiplication by like signs (translated at the next higher level in the onion of operations as "even powers"), and that it can never lead to negative numbers, then $-x$ is meaningless as a result of an even root … except on the "imaginary axis," as we will see below.

[i] The Cartesian quadrants are obviously not to be confused with Wilber's AQAL quadrants.

Absolute Value and the Square-Root Property

All even powers—which as we have seen lead to a deviation from the Cartesian graph into what Descartes called "imaginary numbers"—can be broken down to the square-root, just like even numbers are all multiples of 2. The core of this ambiguity underlying the imaginary axis is the "square-root property" which states that for any positive number *k*, if $x^2 = k$ then we must consider both the positive and negative square roots of *k* in the answer for *x*; $X = +\sqrt{k}$ or $X = -\sqrt{k}$. And this is just the higher root-level codification of the ambiguity of multiplication by like signs.

Recall that the general shape of the graphs of even powers was the mirrored axis of absolute value. Absoluting a value is, in a sense, to disregard the oppositional forces of the transcended-and-included pre-rational transitive-axis and take it in relation to the rational Immanent/Transcendent axis with its intensive forces of pure magnitude. Given that the instability of this ambiguity doesn't show up until the multiplicative level (with like signs, positive ***or*** negative ending positively), this negation occurs only with the multiplicative layer and its doubled y-axis into the Cartesian plane. This multiplicative ambiguity and instability negates the negative integers of the multiplicative y-axis, putting into limbo any transcended-and-included transitive (positive/negative) signs associated with it and causing the dual ambiguity of transitive signs as seen in the square-root property.

The Imaginary as Vestigial Transitive Axis at the I/T Interface

Because the powers and roots have begun to operate fully on the I/T axis, and because they have fully transcended-and-included the transitive-axis, there is a necessary interface or transition that must be explored between the initial oppositional forces and countable infinity of the transitive-axis, and the intrinsically intensive forces of the I/T axis and its nondual-rational positive and uncountable infinity.

The branching point of the imaginary axis is the square-root property, and the deeper-level ambiguity of multiplication by like signs; our kernel of trans-trans instability. Because it is impossible to derive an even-root of a negative number—all like-sign multiplication leads to a positive number—therefore the graphs of even-roots of negative values of *x* end up in the *undefined* land spawned by this oppositional-ambiguity intrinsic to multiplication itself. In this way, powers, operating exclusively on the multiplication of like numbers with like signs, can only interface partly with the transitive-axis and its forces and signs of opposition.

Even powers are fundamentally indifferent to the oppositional forces transcended-and-included with the transitive-axis and introduce a corresponding ambiguity. In order to make that ambiguity tractable into the space of roots and powers, and because there was a clear need for four-dimensional modeling and operation in physics and elsewhere—and also, even more critically because the default pre-rational Cartesian/Euclidean rectilinear geometrical model employed for our conceptualization of numeration reaches its limits at three—the 4th (vestigial) rectilinear-Cartesian axis and dimension of the imaginary numbers was invented.

This occurred through the work of Gerolamo Cardano in the 1500s, but imaginary numbers were not widely accepted until the late 1700s with the work of Leonhard Euler and Carl Friedrich Gauss. Descartes, however, in 1637, first called them "imaginary" in the intuitive recognition of their unconceptual and unmodelable (vestigial) status, with respect to the axioms and axes of the Euclidean/Cartesian system. The imaginary numbers endow the limited 3-dimensional rectilinear Cartesian system with an "extra dimension"—a new "4th dimension" and power much needed in the new technologies and sciences such as electromagnetism, quantum mechanics, signal processing, cartography and control theory.

The Implicit Axiom of Perpendicularity in Trans-Biased Pre-Rationality

Recall our distinction between transitive and immanent/transcendent axes and coordinates.[i]* I/T coordinates, recall, are spherical, being derived earlier in the EOTC (and The Cycle of Unity) as we move from the omni-non-directionality of absolute ***unbounded*** unity in the ONE, to the omni-directionality of the ***bounded*** interface of the ONE-one I/T uni-axis, and from this first unit-identity we derive our first agglomerative line, the essence of the transitive-axis and the starting place and directionality of primitive mathematics coupled to geometry. In this transition, to put it simply, we move from the absolute to the relative and from the unbounded to the bounded. In this sense, in the EOTC, omni-non-linearity comes before uni-multi-linearity, and thus the sphere comes before the line. The line, then, is derived as the interrelation of two or more boundaries, and their respective positions and implicit singularities (Euclidean points).

Transitive coordinates, recall, are points on a line, or on multiple intersecting lines. This is because the definition of "dimension" in the default pre-rational Cartesian system is a function of this transitive uni-multi-linearity, which in turn is a function of the limits of interaction of transitive lines. Rectilinearity, or perpendicularity is the balancing angle in

[i]* See, Coordinates on the Immanent-Transcendent Axis, p142

the interaction or interfacing of ***two*** transitive-axes or lines. It is the angle of orthogonality, or independence, between the two axes. These two rectilinear lines then form an indefinitely extending transitive plane, and the next interface is the orthogonality and perpendicularity between this plane and another transitive-axis or line. This then brings us to the limits of linear orthogonality in the three linear dimensions of the Cartesian system. Being derived from linearity itself, then, the axiom of perpendicularity implicit in the orthodox notion of dimension and its explicit Cartesian coordinate system, is an inherent function of the default (transcended-and-included) transitivity (and countable infinity) of the primitive level of number and operation in our nondual-rational embryogenesis of mathematics.

Each of the first three dimensions of the default trans-biased and pre-rational[i]* Cartesian system is defined as *orthogonal* or 90 angular degrees from the others. And given that this ultimately arbitrary dimensioning system forms the default conceptioning of dimension itself in orthodox mathematics, thus our number-system itself is mapped in accordance to this dimensioning system, in the interface between arithmetic and geometry. In this particularly pre-rational (transitive-centric) system, then, the "real numbers" form the full exploration of the Cartesian axes, mapping the continuum of all rational and irrational numbers. This (ultimately arbitrary) rectilinearity gives the Cartesian system, and the real numbers which are mapped to it, a spatial or geometrical limit at three dimensions or axes. Therefore the imaginary axis, being a 4th dimension to the 3D system, can only unfold *outside* of the (pre-rational) axioms of geometrical perpendicularity mapped to the continuum of the reals, and therefore only in the imaginary land of abstract, "unreal" symbol manipulations and machinations, with no intrinsic and consistent *geometrical* or *modelable* correlation to the first three dimensions; i.e. abstract concept divorced from embodied percept.

Imagining the Unimaginable: Realizing the Unreal

Imaginary numbers are defined at Steven Wolfram's online "MathWorld" as (my ***emphasis***) "a complex number that has ***zero real part***. An imaginary number can therefore be written as a real number multiplied by the 'imaginary unit' *i*," [ii¥] equal to the square root of *-1*. So, with the imaginary numbers we get a new axis and unit-identity to which all imaginary numbers are multiplied.

The Wikipedia article on imaginary numbers states (my ***emphasis***):

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[i]* See, The Image of the Trans-Trans-Bias, p312.

[ii¥] http://mathworld.wolfram.com/ImaginaryNumber.html

> Geometrically, imaginary numbers are found on the vertical axis of the ***complex*** number plane, ***allowing them to be presented*** orthogonal to the real axis.

This systematic orthogonality is an *ad hoc* perpendicularity, however, allowing the mere *semblance* of *geometrical* or *modelable* consistency. In this visualization, the entire self-consistency of the intrinsic perpendicularity and geometry of the volumetric space of the continuum of the Reals must first be abandoned and then artificially *collapsed* into a line or a plane, and the implicit axiom of perpendicularity once again brought into play *after-the-fact*, and arbitrarily to model the implicit orthogonality of the fourth and extra axis. See Figure 39, below [my ***emphasis***].

> ***One way of viewing imaginary numbers*** is to consider a standard number line, positively increasing in magnitude to the right, and negatively increasing in magnitude to the left. At 0 on this *x*-axis, draw a *y*-axis with "positive" direction going up; "positive" imaginary numbers then "increase" in magnitude upwards, and "negative" imaginary numbers "decrease" in magnitude downwards. This vertical axis is often called the "imaginary axis" ….
>
> In this model, multiplication by − 1 corresponds to a rotation of 180 degrees about the origin. Multiplication by *i* corresponds to a 90-degree rotation in the "positive" direction (i.e. counter-clockwise), and the equation $i^2 = -1$ is interpreted as saying that if we apply 2 90-degree rotations about the origin, the net result is a single 180-degree rotation.

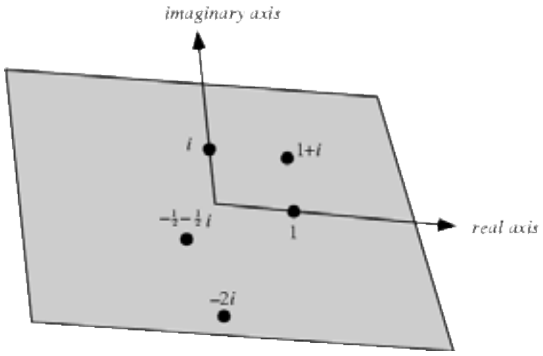

Figure 39: Imagining the Imaginary axis:
The orthogonality of the imaginary axis has no intrinsic rectilinear geometrical relation to the continuum of the reals, and so *after* the rectilinearity of the volumetric continuum of the Reals has reached its limits at three dimensions the perpendicularity of the imaginary axis must be artificially ad hoc added on after the continuum of the Reals has been collapsed to a line or plane and the axiom of perpendicularity once again, arbitrarily, brought into play, to give an ad hoc consistency to the rectilinear system, with its geometrical limits at three dimensions. (image from Stephen Wolfram's Mathworld[ix])

Four-Dimensionality: Trans-Biased vs. Immanent/Transcendent

This symbolic interface is the imaginary number system, which has no *intrinsically* consistent rectilinear metaphor or spatial/volumetric conceptuality to explain its existence and function at the percept-level, but must exist because of the need for four-dimensional parameters in scientific modeling as well as the intrinsic ambiguities and freedoms of the interface between the transitive and I/T axes. This axis, visualized in this ad hoc "imaginary" sense, is the vestige of the limits of the transitivity of the default Cartesian/Euclidean system in its aborted transcension-and-inclusion of the newly accessed uncountable I/T axis of the mult/div and power/root levels, and their respective rational and irrational number systems. As Bucky says:

> Perpendicularity (90-degreeness) uniquely characterizes the limit of three-dimensionality. Equiangularity (60-degreeness) uniquely characterizes the limits of four-dimensional systems.

If we want a four-dimensional *geometrical* and *modelable* system, then we must redefine dimension and orthogonality away from 90-degreeness.

[ix] http://mathworld.wolfram.com/ImaginaryAxis.html

There is nothing intrinsic to the fourth dimension of the imaginary axis that says it must orient 90 degrees from the axis of the reals, except that dimensional orthogonality in the system is already defined in terms of perpendicularity, which has already reached its limit at three geometrical or modelable dimensions. Nor, for that matter, is there anything intrinsic to the numbers themselves that says they must be mapped to a rectilinear system. The implicit axiom of perpendicularity itself is what excluded coherent and conceptual four-dimensionality from standard geometrical modeling in the first place, and it is applied only arbitrarily and after-the-fact in the ad hoc attempt to *self-consistently* imagine the imaginary axis in the perpendicular geometry of the transitive, pre-rationality-based Cartesian system.

In Fuller's *Synergetic Geometry*—which has no initial or default transitive-axis, nor any implicit axiom of perpendicularity tied to its notion of dimension, but begins and ends with transitivity derived and integrated into the I/T axis—there is no need for any ad hoc imaginary axis. This is because the fourth power is entirely conceptual and modelable based not on transitive linearity and its 2nd power interfacing in the implicit axiom of perpendicularity (two axes crossing in angular symmetry), but on the limits of spheres in omni-economical sphere packing, with its primary polyhedron (the tetrahedron, composed of four planes, oriented in four equi-angular lines or dimensions from each other) dividing Universe into the first system—as boundary between the within and without—giving us simultaneously *a priori* volumetric extension and the four omni-symmetric planes and axes of the tetrahedron as the basis for Fuller's intrinsically four-dimensional geometrical system.

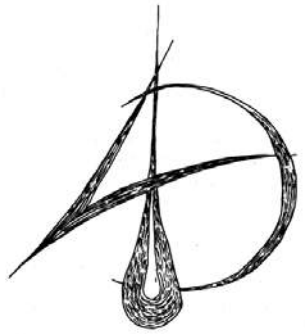

Figure 40: Fuller's 4-D Logo: Fuller's early-adopted symbol for his four-dimensional geometry.

Because the I/T axis is the primary axis in Fuller's Synergetic Geometry—with the first dimension defining the scale of the unit sphere, unfolding the aspect of extension in the very transition from the absolute scope to the relative in the Cycle of Unity—his model is intrinsically rational, based in the axis inherent to the Rational numbers themselves, but transcending-and-*including* the pre-rational transitive-axis in the linearity of each of the omni-symmetrical lines of the tetrahedron, and deriving the cubic rectilinear grid at a higher level in the system. And because of this inherent rationality, and the absence or transcendence of the *default* trans-biased and pre-rational Cartesian system—cubic grids being *derived* at a higher level in the system—there is no problematic transition at the interface between three and four dimensionality in the system of numbers

mapped to Synergetic Geometry. Synergetic Geometry is inherently four-dimensional and so the "imaginary axis," with its ad hoc implicit axiom of perpendicularity, is no longer needed. From this vantage point, the term "imaginary" is vestigial, so it drops off.

Fuller makes it clear in *Synergetics* that it is ultimately arbitrary that we associate the number system with rectilinear geometry and the Cartesian coordinate system. The most common association comes in, perhaps, at the level of powers and exponentiation with the notion of 2^{nd} powering as "squaring" and 3^{rd} powering as "cubing." For example, a^2 is called the square of a because the area of a square with side-length a is a^2, and similarly, a^3 is called the cube, because the volume of a cube with side-length a is a^3. But one of Fuller's first mathematical discoveries was that the same is true of triangles and tetrahedra. See Figure 41, below.

Fuller says, in *Synergetics* [[my comments]]:

> [990.02] All scientists as yet say "X squared," when they encounter the expression "X^2," and "X cubed," when they encounter "X^3" But the number of squares enclosed by equimodule-edged subdivisions of large gridded squares is the same as the number of triangles enclosed by equimodule-edged subdivisions of large gridded triangles. This remains true regardless of the grid frequency, except that the triangular grids take up less space. Thus we may say "triangling" instead of "squaring" and arrive at identical arithmetic results, but with more economical geometrical and spatial results.
>
> Corresponding large, symmetrical agglomerations of cubes or tetrahedra of equimodular subdivisions of their edges or faces demonstrate the same rate of third-power progression in their symmetrical growth (1, 8, 27, 64, etc.). This is also true when divided into small tetrahedral components for each large tetrahedron or in terms of small cubical components of each large cube. So we may also say "tetrahedroning" instead of "cubing" with the same arithmetical but more economical geometrical and spatial results.
>
> We may now say "one to the second power equals one," and identify that arithmetic with the triangle as the geometrical unit. Two to the second power equals four: four triangles. And nine triangles and 16 triangles, and so forth. Nature needs only triangles to identify arithmetical "powering" for the self-multiplication of numbers. Every square consists of two triangles. Therefore, "triangling" is twice as efficient as "squaring." This is what nature does because the triangle is the only structure [[only triangles are self-stabilizing, thus their ubiquitous use in structural engineering]]. If we wish to learn how nature always operates in the most economical ways, we must give up "squaring" and learn to say "triangling," or use the more generalized "powering."

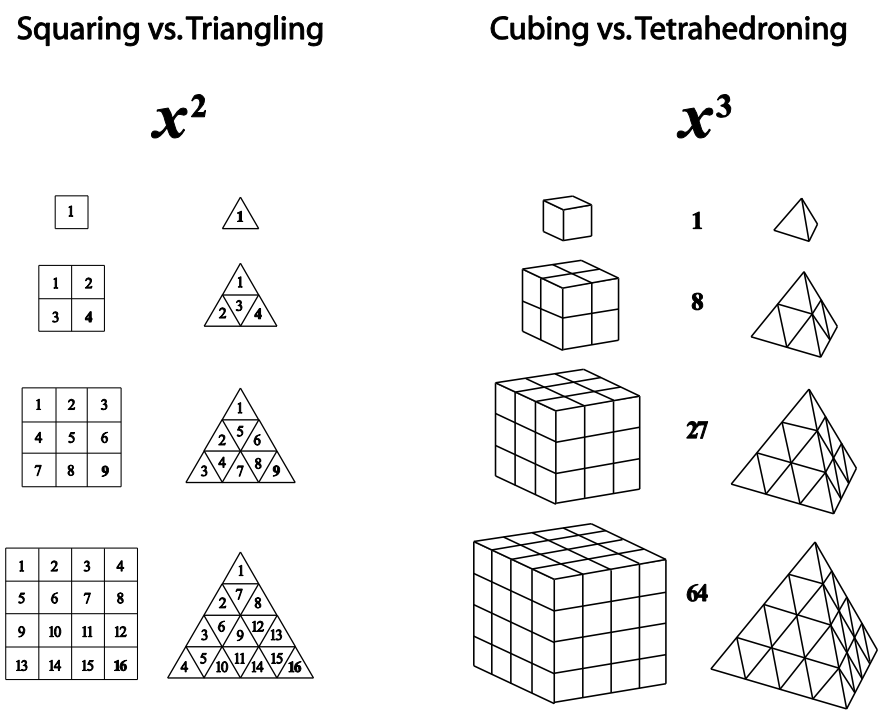

Figure 41: Triangular vs. Rectangular Accounting:
Adapted from Fuller's Figure 990.01 in his Synergetics.

At this point it is clear that powering or exponentiation—and the system of number and operation itself—is not intrinsically rectilinear or cubic, and also that, according to Fuller's view, rectilinear analogs for 2nd and 3rd powering are sub-optimal, relative to his Synergetic Geometry. Indeed William Lauritzen, in his article *Nature's Numbers* and in his "gravity-generated numbers" gives us a triangular multiplication table (adapted in Figure 42, below) which fully replaces the function of the traditional square table, but in less space. Lauritzen, a math professor, tells his students, as would Bucky, that it is inaccurate to say "squaring" for second powering. Squaring should indeed be reserved for operations in geometry that intrinsically deal with squares. Powering is not such a case.

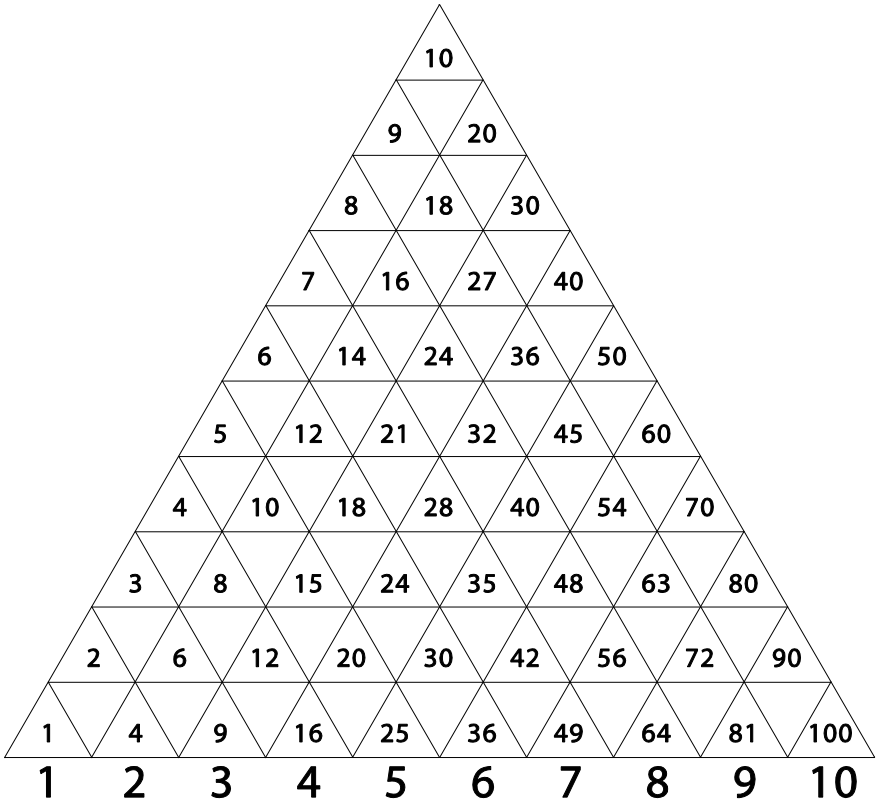

Figure 42: Triangular Multiplication Table:
This figure was adapted from William Lauritzen's "gravity-generated numbers."[i] To use this table, merely find the apex of the equilateral triangle between the two numbers you wish to multiply. One of the advantages of this table is that you need only one row of digits by which to multiply. Each number is multiplied by another number (or itself) from the *same* set.

One of the advantages of this table is that you need only one row of digits by which to multiply. Each number is multiplied by another number (or itself) from the *same* set. Indeed, in this way, it becomes instantly recognizable that powering is a numerical recursion or tautology of sorts, because you don't need two different versions of the same number by which to multiply,

[i] Lauritzen's main row went from 0-9, but I thought the zero row was a bit boring and useless: 0000000000

but only that number by itself. And further, this shows that even if multiplication is a doubling that takes us into the domain of the plane (as discussed in *Multiplication Through Division*), then by no means is this plane inherently square, or rectilinear. Indeed, as we will see, there are very strong structural reasons to consider that the *triangle*, not the square, is inherently planar, mainly because three vertices is the minimum needed for any plane, and also that the triangle is the *only polygon* with inherent structural stability. Another clear and intuitive example of this distinction—where triangling and tetrahedroning is more fundamental and accurate than squaring as a geometrical instantiation of the self-multiplication of numbers—can be seen in the fact that distortions of the squared grid always produce sub-squares of *different* shape and *unequal* area, whereas those of the triangle grid are always exactly the same shape and always the same size in relation to the parent shape. See Figure 43, below, also adapted from Fuller's own diagram.

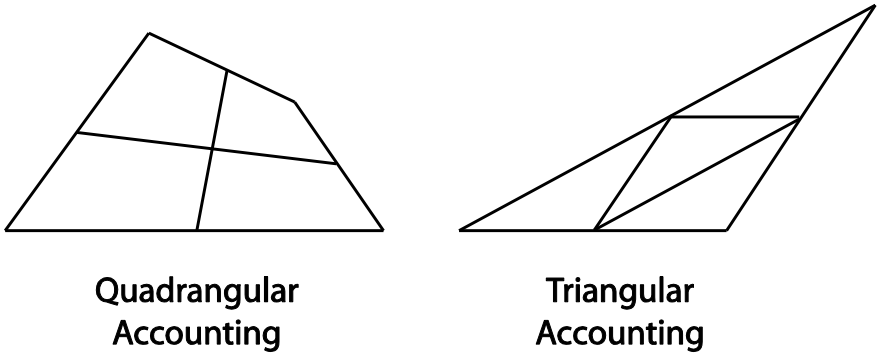

Figure 43: Triangular vs. Quadrangular Accounting (Uniformity):
Adapted from Fuller's Figure 990.01 in his Synergetics. Here we can see that the triangular grid maintains intra-quantitative integrity in its distortions (its parts and sub-parts all maintain their original self-identical shapes and power relationships) whereas the cubic grid, when you move even a single one of its points, disrupts its internal relationships, its shapes becoming dissimilar and its areas unequal. Furthermore, unless the displacement of the point is restricted to the plane of the grid, the grid itself will become non-planar, unlike the triangle framed grid, which can only and always form a plane.

Fuller says [[my comments and ***emphases***]]:

> 990.04 There is another very trustworthy characteristic of synergetic accounting. If we prospectively look at any quadrilateral figure that does not have equal edges, and if we bisect and interconnect those mid-edges,

> we always produce four dissimilar quadrangles. But when we bisect and interconnect the mid-edges of any arbitrary triangle–equilateral, isosceles, or scalene–four smaller similar and equisized triangles will always result. There is no way we can either bisect or uniformly subdivide and then interconnect all the edge division points of any symmetrical or asymmetrical triangle and not come out with omni-identical triangular subdivisions. [[Conversely]] ***There is no way*** we can uniformly subdivide and interconnect the edge division points of any asymmetrical ***quadrangle*** (or any other different-edge-length polygons) and produce omnisimilar polygonal subdivisions. ***Triangling is not only more economical; it is always reliable. These characteristics are not available in quadrangular or orthogonal accounting.***

This problem and distinction is well-known in computer-aided geometric or polygonal modeling, where sculpting in "quads" readily produces inherently non-planar polygons which can cause problems later on, whereas triangle polygons *always*, and can *only* be planar, no matter what the arrangement of their vertices are.

Structural vs. Representational Relation

Instead of the purely representational implicit axiom of perpendicularity and the Cartesian coordinate system, which is designed merely to ***locate*** and ***represent*** a point in volumetric space, Fuller takes a much more structural and grounded approach to his conceptuality and representation, solidly reaching the intrinsic four-dimensionality of structural relation from many different angles.

For example, if you take three sturdy rods and tie their ends together securely with a loose bit of rope or elastic, forming a triangle, the structure will be sturdy and not deform. Do the same with the *four* rods of a square and you get a wobbly mess. Build a cube out of those wobbly squares and it doesn't get any stronger, but collapses on the floor. You can build a tetrahedron out of the tied-together triangles, however, and it will stand strong of its own accord. This is essentially why "the triangle is the only structure in Universe," as Bucky would say.

Four dimensionality can be reached purely representationally as well based on the relations between locations, points or event-stars, as Bucky called them. The first event-star defines only itself. Add another one and you get the first relation, the line, or vector. Add a third event star and you define a plane between them, and no matter where you move each of them, they can only define that plane. When you add a fourth event-star, however, it inherently adds the dimension (or axis of freedom) of volume, because if any one of them is at all out of line with the plane intrinsically defined by interrelation of the other three, then their relations instantly define a volume, the tetrahedron, dividing a within from a without. This is the volume intrinsic to the four points of the tetrahedron, which—as the first

structure to enclose an inside from an outside—is "the prime structural system in Universe"—the simplest closed volumetric form made exclusively out of the prime structural element; triangles. See Figure 44, below.

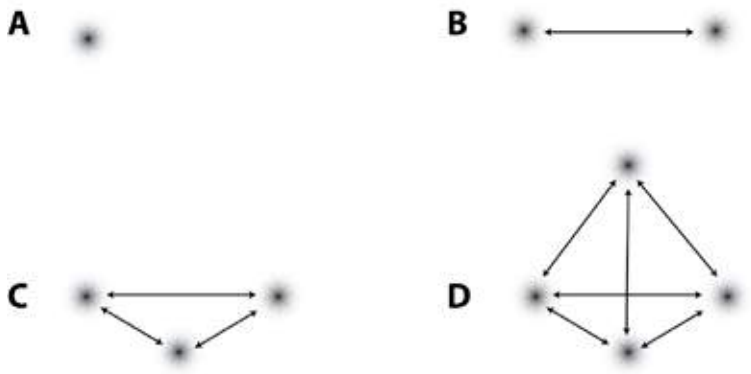

Figure 44: 4-D Event-Stars:
The first event-star defines a point, a location. Adding the second event-star defines a relation, a line between two points. Add the third star and they can but define a plane, no matter where they are placed. Only with the fourth do we get a volumetric relation between the points, and if the fourth star is misplaced from the plane of the other three (which is infinitely probable in the infinite thinness which defines the plane), then we instantly have a relation of volume. So we see that planarity is inherently triangular and volumetricity is inherently tetrahedral.

Another example of the intrinsic four-dimensionality of structural relation involves the closest packing of spheres—our prime *non-structural* system in Universe as the first-dimension and aspect interface between immanence and transcendence—from which all of *Synergetic* geometry is ultimately derived. Similar to the above event-star model, but using expanded spheres, we add them up and see what happens—this time, however, in terms of degrees of freedom of rotation.

A single sphere floating in space is free to rotate in any direction. Add a second one touching the first and, like two gears, they must rotate in tandem, each on the same plane as the other. Add a third touching sphere and they are constrained to rotate together inward or outward, involuting or evoluting along a line running through their middle. See Figure 45, below. But again, when you add that fourth sphere, forming the sphere-packing version of the tetrahedron, suddenly the touching spheres can no longer rotate.

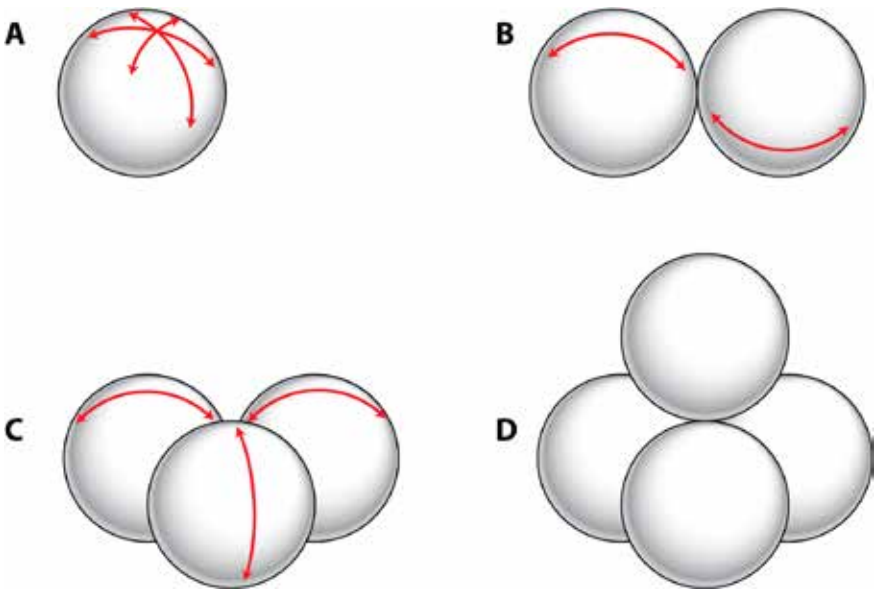

Figure 45: 4-D Event-Spheres:
Adapted from Fig. 411.05, from *Synergetics*. "Four Spheres Lock as Tetrahedron:"

A: "A single sphere is free to rotate in any direction."
B: "Two tangent spheres although free to rotate in any direction must do so cooperatively."
C: "Three spheres can rotate cooperatively only about respective axes which are parallel to the edges of the equilateral triangle defined by joining the sphere centers, i.e. each sphere rotates toward the center of the triangle."
D: "Four spheres lock together. No rotation is possible, making the minimum stable closest-packed-sphere system: the tetrahedron."

Another convergence on the inherent four-dimensionality of structural relation is seen in the investigation of what it takes to restrain one sphere in space by means of tension strings. Take a sphere floating in space and tie a string to it. The sphere is constrained to the limits of the string, but it is free to move anywhere within a larger sphere defined by that constraint as radius. See, below. Now add a second restraint on the other side of the sphere and pull taut in the opposite direction. The sphere is now free to move only in a plane or disc defined by the tautness and limits of those two

first constraints. Now add a third constraint, forming a triangle and the sphere is only free to move in a line through the center of that triangle. Add one more constraint, a *fourth*, forming the frame of a tetrahedron, and suddenly the sphere can't displace at all.

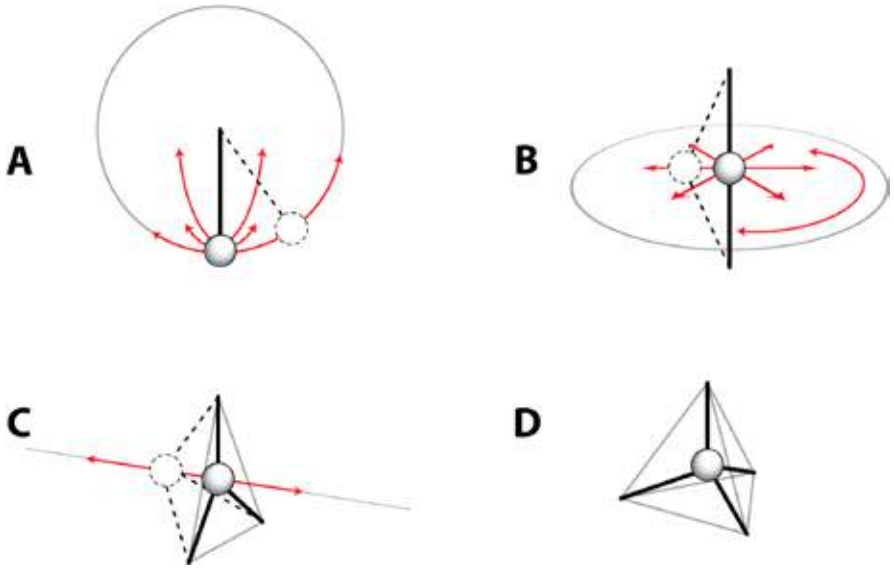

Figure 46: 4-D Restraints: "Four Vectors of Restraint Define Minimum System": Adapted from Fig. 401.01, of Synergetics. "Investigation of the requirements for a minimum system."

A: "One vector of restraint allows ball to define complete sphere…" a volume
B:"Two vectors: a plane…"
C: "Three vectors: a line..."
D: "Four vectors: a point—no displacement…"

So from several different empirical, experiential and modelable methods we can see that there seems to be an intrinsic four-dimensionality to *structural* relation itself, which would give an implicit reasoning for the four-dimensional accounting discovered by scientists and only tacked on *ad hoc* and after-the-fact to the Cartesian rectilinear geometric system as the imaginary axis. Conversely, the three-dimensionality of the Cartesian system seems to be merely the simplest number of dimensions required to *locate* or *represent* a position in space, otherwise entirely free from structural, physical and material considerations altogether. Perhaps, then,

as Deleuze might agree, the Cartesian System of representational relation is a natural outgrowth of an age dominated by representational forces. The question then, perhaps, becomes one of the value of structural vs. representational geometrical accounting systems, as applied to our specific needs.

But there is much more that needs to be added to our meta-paradigmatic equation. Because Fuller's system is intrinsically rational (based on the I/T axis of the rational itself), and because it is based on structural relation and therefore intrinsically four-dimensional, the interrelations among its parts and generated geometries end in wholly rational, and often whole numbers, which is not the case when starting with the cube as unity. Though we don't have the time or bandwidth to get fully into the pros and cons of this system, I'll quote a few sources on its behalf.

Kirby Urner says in his *Synergetics on the Web*[i¥]:

> The four-sided tetrahedron is the simplest possible enclosure—which is why mathematicians call it a "simplex". … Given the status of the simplex as "simplest space-enclosing network", the decision to use its regular form as a unit of volume makes some sense. As a consequence of this decision, we obtain whole number volumes for other familiar shapes (including for the cube). This aesthetically pleasing and streamlining result provides additional reinforcement for those taking the time to learn this alternative (yet logical) approach to spatial geometry.

Fuller's editorial collaborator on *Synergetics,* Ed Applewhite, describes Synergetic Geometry thus [[my comments]]:[ii¥]

> Synergetics is Fuller's name for the geometry he advanced based on the patterns of energy that he saw in nature.
>
> For him, geometry was a laboratory science with the touch and feel of physical models—not rules out of a textbook. He started with models of the closest packing of spheres. From that basic starting point he derived triangles as the most economical relationship between events.
>
> He did not start with Euclid's lines in the sand or Descartes' cubes and square XYZ-coordinates. Fuller felt that the old classic approaches did not describe the way nature actually behaves. For instance, Euclid's lines were thought to go off to infinity. Fuller says lines are vectors of energy and he rejected the notion that anything physical could be extended indefinitely.
>
> Descartes cubes are unstable forms. For Fuller, the world is built of stable, finite structures. His triangular coordination depends on

[i¥] Biblio-note.

[ii¥] http://bfi.org/node/560

> tetrahedral models. … Four spheres close pack into a stable tetrahedron: good. Eight spheres stack into an unstable cube: bad. His geometry hinges on the tetrahedron, the simplest structural system with insideness and outsideness: he advances it as the most economical way to measure space and to account all physical (and metaphysical! [[thought]]) experience.
> This is what he calls synergetics: an empirical mathematical system in which geometry and number mesh without fractions. It gains its validity not from classic abstractions but from the results of individual physical experience. His two-volume work "Synergetics" has the subtitle: Explorations in the Geometry of Thinking.

Amy C. Edmonson says in her *A Fuller Explanation* [[my comments]]:

> Synergetics is the discipline hiding behind Fuller's fantastic visions of a sustainable future [[and indeed behind his fantastically successful architectural innovations of the geodesic dome and octet truss.]]. These reliable patterns were the source of his unshakable confidence in his design-science philosophy, which—in short—upholds that innovative application of the principles governing nature's behavior can insure ample life support for all humanity. While many people around the world have been exposed to Fuller's ideas and inventions, few have understood or even been aware of the mathematical principles underlying the elegant efficiency of structures such as the Octet Truss and geodesic dome. Happily, these principles are easily accessible once you get into the spirit of Fuller's approach: synergetics is a "hands-on" branch of mathematics.

Edmonson continues quoting Fuller:

> "The fact that 99 percent of humanity does not understand nature is the prime reason for humanity's failure to exercise its option to attain universally sustainable physical success on this planet. The prime barrier to humanity's discovery and comprehension of nature is the obscurity of the mathematical language of science. Fortunately, however, nature is *not* using the strictly imaginary, awkward, and unrealistic coordinate system adopted by and taught by present-day academic science. (000.125b)"
>
> Nature is instead using the principles embodied in synergetics, which thus provides the way to eradicate this lethal ignorance. Claiming to have discovered no less than the mathematical system that describes the coordination of physical and metaphysical phenomena alike—that is, of both energy and thought—Fuller was urgent in his insistence that we study these principles:

Fuller says in Synergetics:

> 990.05 The increasingly vast, comprehensive, and rational order of arithmetical, geometrical, and vectorial coordination that we recognize as synergetics can reduce the dichotomy, the chasm between the sciences and the humanities, which occurred in the mid-nineteenth century when science gave up models because the generalized case of exclusively three-dimensional models did not seem to accommodate the scientists' energy-

> experiment discoveries. Now we suddenly find elegant field modelability and conceptuality returning. We have learned that all local systems are conceptual. Because science had a fixation on the "square," the "cube," and the 90-degree angle as the exclusive forms of "unity," most of its constants are *irrational.* This is only because they entered nature's structural system by the wrong portal. If we use the cube as volumetric unity, the tetrahedron and octahedron have irrational number volumes.

The "wrong portal"—what he famously called "the attic window"—as we have discovered, is the transitive-axis and its multiple *uni*-directional axes which map the transcendent in terms of the transitive (and the intensive in terms of the oppositional) and fundamental linearity, entirely skipping over the immanence within, and the VL-axis intrinsic to the rational numbers. Fuller's system, on the other hand, as we have seen, begins mensuration and dimension on the I/T axis, deriving the cubic and transitive system at a higher level, fully transcending-and-including it in the process. Because of this, Fuller's system manages to escape many of the irrational constants and unattainable probabilities that plague the standard xyz model and its "imaginary" uses and adaptations in the sciences.

Fuller continues later in *Synergetics* [my ***emphasis***]:

> Nature would use the tetrahedron as the module of subdivision because nature has proven to the physicists and the other physical scientists that she always chooses the most economic realization. Cubes require three times as much Universe as do tetrahedra to demonstrate volumetric content of systems because cubic identification with third-powering used up three times as much volume as is available in Universe. ***As a result of cubic mensuration science has had to invent such devices as "probability" and "imaginary numbers."*** Thus "squaring" and "cubing," instead of nature's "triangling" and "tetrahedroning," account for science's using mathematical tools that have no physical-model demonstrability–ergo, ***are inherently "unscientific."*** (986.067-9)

Fuller points out indeed that as a result of measuring its intrinsically four-dimensional constants on the basis of a three-dimensional cubic grid, many of the constants of science ended in irrational and imaginary numbers and probabilities, instead of the rational and whole number constants derived time and again in his Synergetic geometry.

Unfortunately, we cannot get more in depth into this fascinating system of Synergetics, this work serving only in part as a meta-dimensional, meta-mathematical or meta-paradigmatic interface between Synergetics and the standard Cartesian system. Furthermore, it may indeed be the case that the time is still not ripe (and it may never be) for a cultural transition to Synergetics as a default dimensional/geometric/mensurational paradigm. Synergetics may indeed be too robust and complex a foundation for the LCD of humanity, as it now stands, even though Fuller thought (and maybe correctly) that Synergetics would be perfect for five-year-olds, as Edmonson

claims. The point herein is to emphasize the contrast and distinction between the two; to develop an inter-paradigmatic interface for facilitating a more evolved discernment.

The Trans-Rationality of the Irrational Numbers

> *To how many places does nature carry out PI when she makes each successive bubble in the white-cresting surf of each successive wave before nature finds out that PI can never be resolved?... And at what moment in the making of each separate bubble in the Universe does nature decide to terminate her eternally frustrated calculating and instead turn out a fake sphere? I answered myself that I don't think nature is using PI or any of the irrational fraction constants of physics.* — Buckminster Fuller, *Synergetics*

As might be expected, at this point in the holarchical embryogenesis of mathematics—just like with the iopol reversal of both the default agglomerative/transcendent operations (multiplication and addition) to their new *deglomerative/immanent* operations (subtraction and division) which generated a new function and class of number—the integers and rationals, respectively—with the iopol reversal of the powering function into the roots comes a new function and class of number, the irrationals. And just as with the previous iopol-inverted operations, not every operation on every number will break the closure of the previous number-set into the new.

The Wikipedia article on irrational numbers states:

> Hippasus discovered irrational numbers when trying to represent the square root of 2 as a fraction (proof below). However Pythagoras believed in the absoluteness of numbers, and could not accept the existence of irrational numbers.

Pythagoras was right in the Intuitionist sense[i] that the irrationals are more properly *functions*, rather than *numbers.* But the Rationals as well are also generated by functions, and as Kronecker effectively said, are not merely god-given numbers, but ratios between (transcended-and-included) integers. But the integers themselves also are created by the function or operation of subtraction, iopol reversing the iterative set-generating function of counting by ones; the unit-identity.

[i] Intuitionists, following Kronecker, see all numbers greater than the integers as functions.

The article continues:

> [Pythagoras] could not disprove their existence through logic, but his beliefs would not accept the existence of irrational numbers and so, as legend had it, he had Hippasus drowned. Theaetetus worked with other quadratic irrationalities, but it wasn't until Eudoxus developed a theory of irrational ratios that Greek mathematicians accepted irrational numbers. Euclid's Elements Book 10 is dedicated to classification of irrational magnitudes.

From earlier in the article we get a definition of irrational numbers as follows:

> …the irrational numbers are precisely those numbers whose expansion in any given rational base (decimal, binary, etc) never ends and never enters a periodic pattern. Almost all real numbers are irrational.[i¥]

So the key difference between the functions of number—and the polarities and operations that generate them—prior to the power/root level and its irrational numbers, is that the irrational numbers are operations *that never come to an end*; they never rest on a final number. They are immanent infinities opened by the fact that the power/root level is operating *fully* on the Immanent/Transcendent axis and its uncountable infinity.[ii]

With the square roots of certain numbers, mathematicians have been able to prove that the decimal expansions never repeat or terminate as the number gets ever closer and closer approximated in relation to the numerical identities transcended-and-included in the Rational numbers and the real number-line. Irrational numbers are unbounded, in this sense, that on the I/T axis, in the direction of immanence, they never terminate, yet they are bounded in relation to the transitive number-line, because they are found within certain limits thereof. Irrational numbers, then, are simply 3rd order (modal or bounded) infinities, expressed only approximately, in numerical form. The square root of both 2 and 10 are the common examples of such irrational numbers.[iii]

Cantor himself noted that the irrational numbers are more properly infinities, or "infinite numbers," with his recognition of their affinity with his

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[i¥] Wikipedia: irrational number: <http://en.wikipedia.org/wiki/Irrational_numbers>

[ii] Though it may indeed be the case, as Fuller seems to argue, that the frequency of our encounters with mathematical irrationality (as well as probability) are a function of having "come in through the attic window" of the transitive-axis and mapped all of number and reality to the perpendicular limits thereof. The number pi, is a classic example, for Fuller.

[iii] Open Question: What is the significance of the fact that the first two irrational numbers are the square-roots of 2 and 10? Does it show the limits of a more rational, or immanent/transcendent, base-nine system underlying the transitive base-ten, as Bucky intimated (e.g. "casting out nines")? What has this to do with the symmetrical Scheherazade numbers?

transfinite numbers. As Richard Arthur writes in his article *Leibniz and Cantor on the Actual Infinite*, quoting Cantor:

> "The transfinite numbers are in a certain sense *new irrationalities*, and in my view the best method of defining the *finite* irrational numbers is quite similar to, and I might even say in principle the same as, my method of introducing transfinite numbers. One can say unconditionally: the transfinite numbers *stand or fall* with the finite irrational numbers: they are alike in their innermost nature, since both kinds are definitely delimited forms or modifications of the actual infinite."[i¥]

Indeed, in the nondual-rational view as well, the irrational numbers are defined in the very same way as Cantor's transfinites. Their difference is mainly in their directionality: immanent vs. transcendent. Recall that we defined the transfinite numbers as aspect infinities, or set-aspects (aspect infinities abstracted out of The Infinite by set-generating algorithms), and that the bounded or modal infinite is a specific type of aspect infinite dealing with the immanent pole of the Immanent/Transcendent axis—an encapsulated and immanent infinite number. They are immanent infinities abstracted out of The Infinite as a function of the operation of rooting, with second-order recursion breaking beyond the bounds of the stepwise procedures of the countably infinite.

Arthur continues:

> Here Cantor alludes to the fact that just as irrationals can be conceived as limits of infinite sequences of rational numbers, so transfinite numbers can be conceived as limits of infinite sequences of natural numbers, in each case added in immediately after the sequence they limit. If one rejects transfinites, what right has one to allow the extension of the number system to include irrationals? A reluctance to jettison the theory of the real line thus explains the widespread acceptance among modern mathematicians of the Cantorian theory of the infinite.

In Interface Mathematics there is no jettisoning necessary of any of these operations, but merely a reinterpretation in a more coherent, more evolved, integral, and rational context. Rational numbers are, more properly, functions of recursive (non-stepwise) division (rooting) or relation between integers which, while opening up fully the uncountable infinity of immanence, still give the finite and final result of a number as boundary or precise location in the mathematical continuum unreachable by rational or stepwise operations. Irrational numbers, on the other hand, are the consequence of higher level functions or relations (i.e. the square-root function with its "2nd tier" level inversion of the input/output polarity), that fall between the transcended-and-included transitive limits of the rational

[i¥] Cantor, 1887-8

numbers. They are the "Dedekind cuts" in terms of limits of transitive representation on the real number-line into decimals or binaries, which give actual infinities (unbounded answers), not final numbers as boundaries.

The fact that the irrational numbers give actual infinite (unbounded) results demonstrates that the power/root level is operating fully (if not optimally, coming from the aborted rationality of the default Cartesian system) on the Immanent/Transcendent axis, and has fully opened to the uncountable immanent infinite neglected by the trans-bias of default agglomerative or stepwise transcendent operation. Thus, like Cantor's "transfinite numbers," irrational numbers are aspects of the infinite interfacing with the finite function that generated the number; they are bounded aspect infinities, not numbers as finite boundaries. As modal aspect infinities, they are bounded only with respect to the transitive axis, and unbounded in the immanent direction, identically opposite to Cantor's transcendently unbounded infinite numbers. As Deleuze says, in *The Fold*:

> The irrational number implies the descent of a circular arc on the straight line of rational points, and exposes the latter as a false infinity, a simple undefinite that includes an infinity of lacunae: that is why the continuous is a labyrinth that cannot be represented by a straight line.

Thus given that the "secret of the rational" is the positive infinite of the immanent (as opposed to the regressive disaster of the medieval notion of the infinite), the "irrational numbers" are "essentially" and *deeply* rational. Perhaps undeniably, if we are allowing infinities to be numbers, as we are in this post-Cantor world, then the "irrational numbers" are more correctly "trans-rational" or "immanent infinite-numbers"—the mathematical instances of the bounded or immanent aspects of The Infinite. And so, here we find yet again a transcendent-bias in that immanent, boundless numbers are considered non-rational, or "irrational" and transcendent infinite numbers are *naturally* just infinite numbers. In other words, there is a ready place for the transcendent forms of the infinite, but the immanent manifestations, in this transcendent-biased pre-rational system, have no place except in the negative (irrational) form. The positive infinity of the secret of the rational has yet no home in the pre-rational, representational system.

AFTER-MATH: INTEGRATING THE DIFFERENTIATIONS FROM THE SECOND TIER

THE MAPS OF INTERFACE MATHEMATICS

The Map of the Holarchy and VCS Axes of Mathematical Operations

Interface Mathematics, as a holarchical embryogenesis of number and operation (identity and relation, noun and verb), can be viewed in several different ways. We have already seen the Onion of Operations graphic above (p345), showing the general holarchy of operations, and this can be modified to include the two main VL-axes in the VCS and the transition between them as number and operation move through the trans-bias (yang-bias) and into the operationalization of immanence (yin) from which the unit-closure tacitly commenced in the first place (recall our Cycle of Unity).

From the viewpoint of operation, we can trace the movement from the origin of mathematics—the first boundary from the unbounded, or the 'one' from the 'ONE'—into the transitive axis or plane of addition/subtraction, then through the transition onto the I/T axis with the mathematical ratio and its violation of unit-closure, and then fully onto the I/T axis with its operationalization of the prior polarities in the explicit rules of the exponents, opening up finally from the trans-bias to the immanent infinities of the "irrational numbers." See Figure 47, below.

Note that in the inset of the diagram, we can see that the evolution of number is, in a sense, overcoming the transcendent bias, in that number only comes to new function in the direction of immanence, as it breaks closure with subtraction, then division and then finally with rooting. (Immanence is the feminine principle, or yin, recall, so naturally we can see that number itself is "given birth" to or emergent from yin—in critical and necessary interaction with the dominant and dominating forces of yang.) This is how the rational levels and beyond function in the context of the trans-biased, pre-rational transitivity embodied most elegantly in the Cartesian coordinate system as the default geometry for our conception of number, leaving the 4^{th} dimension (intrinsic to the rational mensuration of science) as merely a vestigial, imaginary transitive-axis, stuck ad hoc by an outmoded implicit axiom of perpendicularity to the collapsed coherency of the pre-rational geometrical system.

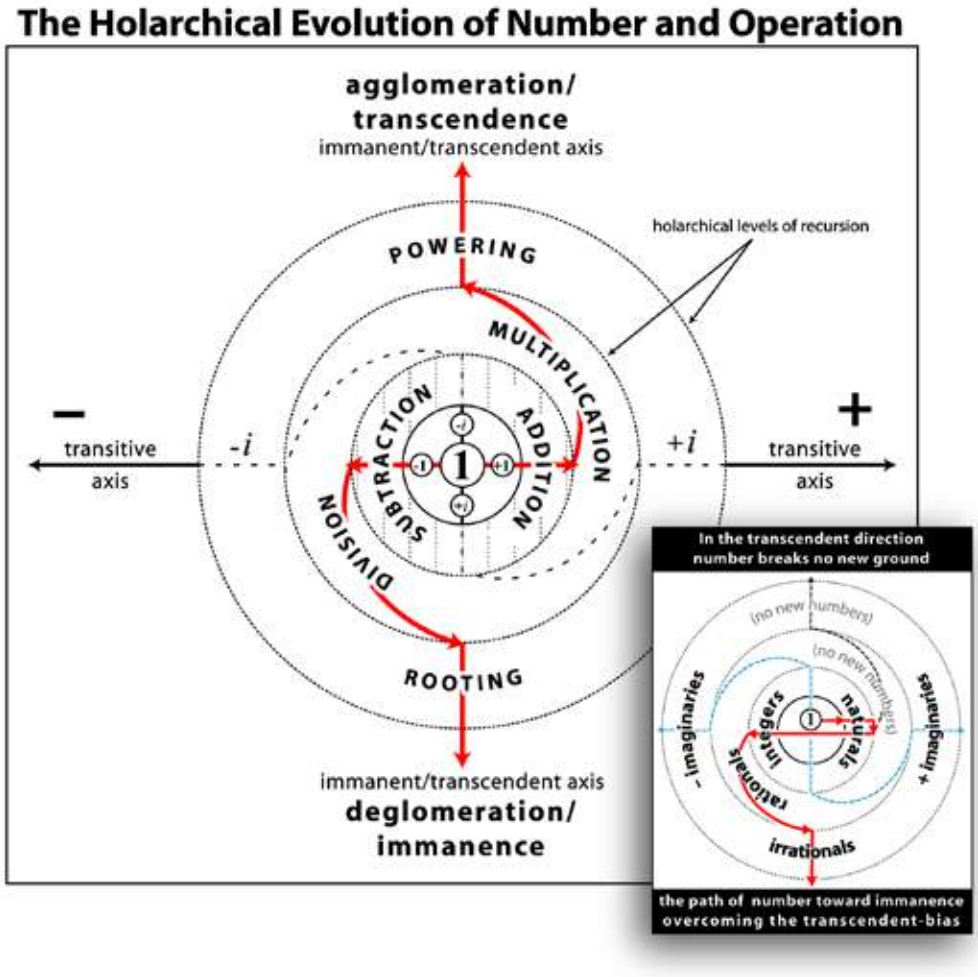


Figure 47: The Holarchical Evolution of Number and Operation in the Vision-Logic Coordinate System:
Following from the main VCS diagram—with transitive-planes visualized as orthogonal to the I/T axis—addition and subtraction begin on such a transitive-plane. Multiplication/division begin to transition onto the I/T axis, moving toward parallel with it, and the power/root level operates fully on the I/T axis. Note the "vestigial" transitive-axis of the imaginary. In the transitive, pre-rational space of the Cartesian system, the 4th dimension—intrinsic to rational dimensioning itself (see Fuller's Synergetics)—has no geometrical grounding. In Synergetic geometry, with its explicit grounding in the rational I/T axis, there is no need for this vestigial transitive-/perpendicular axis, so it drops off. Inset: The evolutionary path of number is outlined as it moves from the default transitive mapping of transcendence in additive agglomeration and the naturals, into the successive violations of closure in the input/output polarity (iopol) inversions of the corresponding levels of agglomerative recursion. From the naturals, the iopol is inverted (initially toward deglomeration) to give us the integers and then the iopol of the operation of multiplication is inverted to give us the rationals, following which the iopol of powering is inverted to give us the irrational square-roots.

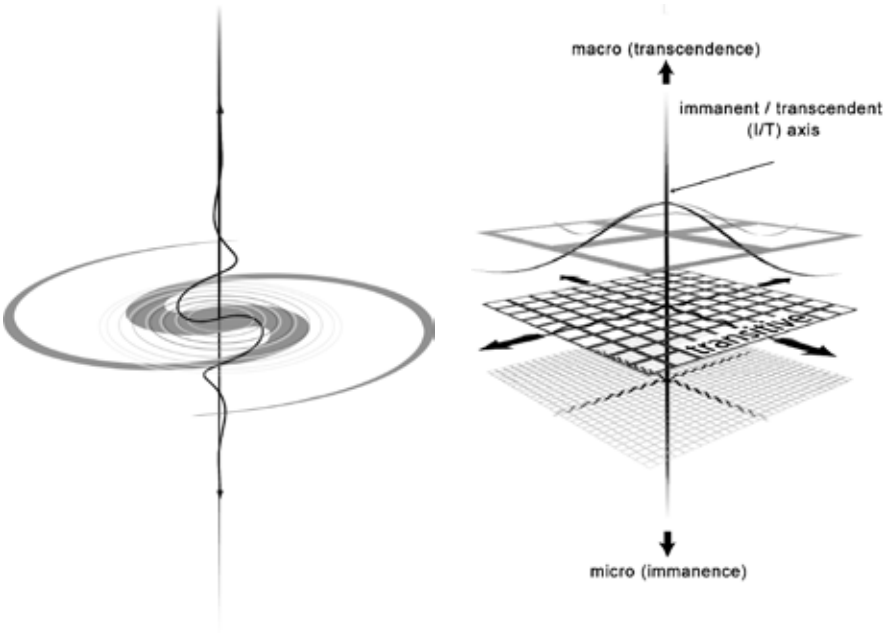
The Core SpinbitZ Diagram

This same basic evolutionary movement and general form can also be traced, and more accurately so, as a three-dimensional vector along with the dimension of time (see Figure 48-A, below); 1) from the undifferentiated ONE-ALL into the ONE-one I/T uni-axis and then 2) quickly shunting into the orthogonal laws and rules of transitivity mapped to transcendence (the trans-trans-bias), and then 3) only through the holarchical embryogenesis of function and identity (operation and number) moving steadily (emerging and transcending) toward operation again on the originary I/T axis.

In Nondual Rationalism, recall, there is a shift from the regressive pre-rational notion of infinity (which sees immanence, yin or Emptiness as a foundational disaster), to an affirmation of a "deep infinity" (as M.C. Escher intuits it) or, as Deleuze calls it, a positive infinity as the "secret of the rational." The main axis in this core diagram (diagram A) represents this "positive infinity," operationalized in the VCS as the Immanent/Transcendent axis. In the animated version on the SpinbitZ website (http://www.spinbitz.net/) there are points of light moving in both immanent and transcendent directions from the central transitive plane, representing the directions of transcendence and immanence operating simultaneously in transcendence or evolution. In the static version, this polar, or bi-directional evolutionary motion is denoted by the spiraling arrows.

Note that the shape of the spiral isn't important for the evolution itself, and is a drastic generalization (largely for aesthetic purposes) in an already vastly over-simplified linearity. In mathematics, for example, the shape of the emergent curve would have an underlying quantized saw-tooth wave pattern, as the number set-closures are successively violated by the corresponding iopol inversions of the new operations—and number and operation ratchet themselves into higher and higher functions in tandem, as we will see below.

In psychological or spiritual development, as well, the shape would have all sorts of stops and starts, different velocities and directions and various paths running simultaneously as the diverse lines of intelligence evolve at different rates, from a range of starting places, through many levels and plateaus of being.



A. **B.**

Figure 48: SpinbitZ Diagram, Primal Form:
A: In this central diagram in SpinbitZ we see the VCS, as it generally applies to all forms of vision-logic-level percept-concept in NDR, from philosophy to mathematics to epistemology. The key elements in this diagram are as follows (see diagram **B**, for reference to the VL-axes and planes of the VSC underlying the forms of diagram A). Following the red line as it moves in both directions orthogonal from the central I/T axis, we begin in the transitive rules and forces of opposition (e.g. the positive and negative signs of addition, or the dualisms and platonic absolutized categories of pre-rational, pre-pulverized philosophy). From there the embryogenesis of the concept unfolds, moving explicitly in the transitive mapping of transcendence, but simultaneously also (if tacitly, through successive iopol inversions, e.g.) in the immanent direction toward ever higher, wider and *deeper* functioning on the Immanent/Transcendent axis.

This core SpinbitZ diagram, then, basically acknowledges this positive infinity at the heart of rationalism (opened up in the "violation" of unit-closure with the mathematical ratio) and shows the nonduality or polarity of immanence in transcendence. It renders visually and very generally the realization that evolution itself—including the evolution of mathematics, science, philosophy, consciousness, art and even spirituality—begins on an emergent (transcendent) "transitive plane" of existence, oriented by default in the "orthogonal" direction to this positive infinity and uncountable I/T

axis. These transitive planes unfold or emerge from the I/T axis as already transcendent forms or levels of reality, but forms and operations thereupon are oriented and configured by default—due to the trans-bias and the transitive mapping of transcendence—to instantly move away from it, conceptually, or representationally. The forms and operations are initially (and very generally) blind to the I/T axis (and immanence in general) because it is pre-representational and pre-operational and the "fitness function" of evolution is initially invested in the mapping and operationalization of transcendence via the transitive forms and forces of categorical identity and opposition; rudimentary polarization into simplistic terminals and opposites.

In philosophy, this initial transitivity corresponds to such things as "essentialism," dualism or foundationalism—basically superficial and relative-bound absolutized, categorical thinking. Starting with the unit-closure of the personal identity and the platonic forms and absolutized categories, as well the transitive forms of the various foundationalisms and dualisms, we then move onto the I/T axis with the pulverizing of the closure of the self-identity of the forms—in the acategorical imperative of the key rationalists (and the nondualists long before them)—opening up the Emptiness of the positive infinity of the rational to the univocal unity of the ONE-ALL and its Immanent/Transcendent axis.

In consciousness, the epistemic (representation) and spirituality, the transitive corresponds first to egoism (and the Cartesian cogito-interface), then, moving outward (transitively and transcendently) as the self-boundary expands, we move simultaneously up the spiral (transcendence). But, according to the principle of immanence in transcendence and the positive infinity, as evolution progresses, or as transcendence moves forward, it begins to turn from the transitive mapping of transcendence and move closer and closer, full-circle, back to its origin (the integral capacity) on the I/T axis and hence toward immanence, the "deep infinity," at the same time.

In meditation itself, the goal is indeed to get closer and closer to this axis whose temporal aspect, recall, is the "eternal NOW," Spinoza's *sub specie aeternitatis*, participating in eternity in the instantaneous "intellectual love of God." (See Figure 10, repeated below from p189.) This goal is the "flat-lining" of living in the moment, free from the turbulence of the categorical forms of memory and anticipation, the illusions of the past and the future, often absolutized with disastrous effect.

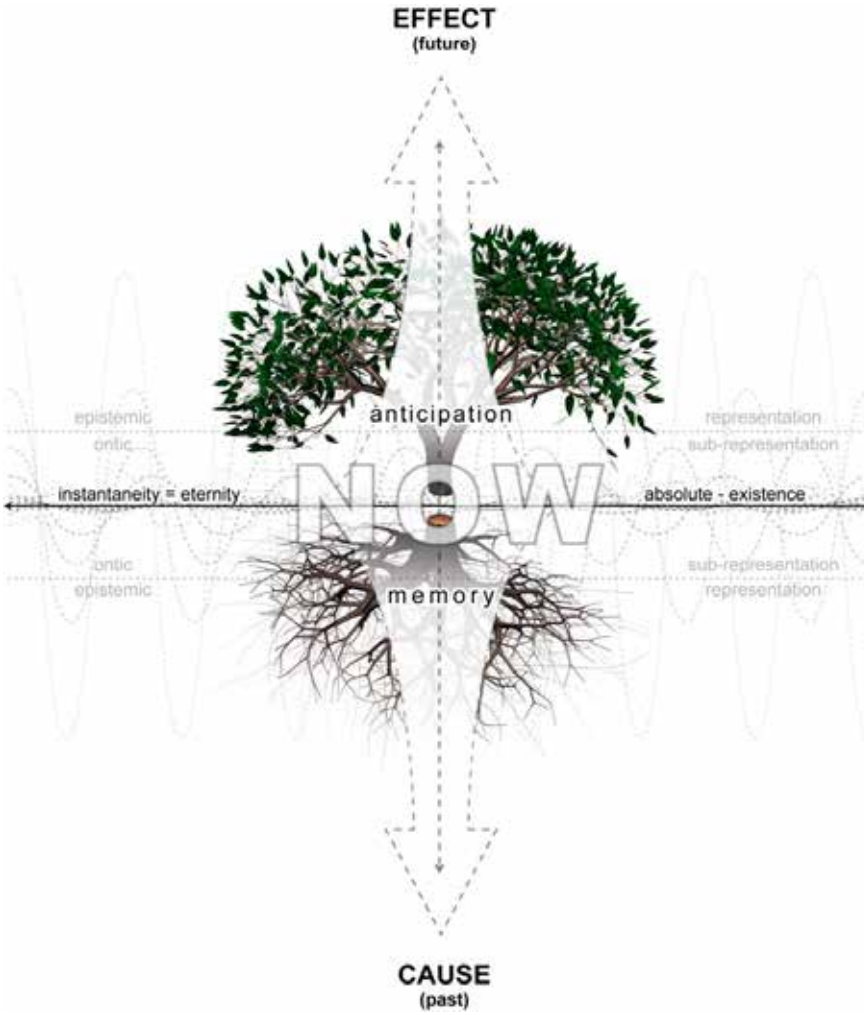


Figure 10: Time Tree: Figure repeated from *Univocity and the Eternal NOW* (p189)

In the evolution of science we see this move toward immanence in transcendence in the simultaneous expansion of the empirical/theoretical sphere of the macro and the micro, where curiously we always seem to sit right in the middle, with meta-galactic voids on one side and "Planck's constant" almost exactly equidistantly on the other—in orders of magnitude.

This path in the physical sphere moves from the unit-closure of atoms, into the transitive laws of molecular agglomeration, into the higher complexities of intelligent evolution, into primitive cultures with tool-making from vastly agglomerated numbers of unit-atoms.

Note also, that only with trans-rationality, in its techno-evolutionary form, does evolution begin to break the unit-closure of the atom and move more fully into immanence and transcendence simultaneously in their explorations and manipulations of the micro and macro cosmos. Beneath the level of the atom, we have an explosion of more and more "particles," which are more like wave resonances, constantly changing form into other particles and most with very short-lived existences. These particles as resonances are more properly seen as functions of the forces of intensity, having not coalesced into singular, nucleated form (finite unities) in opposition to others. These resonances have no self-consistent, self-maintaining form and identity of their own (no Leibnizian "principle of unity" and no Spinozan homeostatic relative essence), but come into being as fleeting resonances, dissonances and harmonics from very specific interactions and environments often in the break-down of particles with real, nucleated, unitary identity, such as the proton or neutron.

The forces of opposition begin only when there is unit-closure into the emergent, self-stabilizing forms of finite unity. This is when the Spinozistic homeostatic, strange-attractor notion of "essence" and the Leibnizian emergent "principle of unity" come into play.

Also, in the animated version of the core SpinbitZ diagram (spinbitz.net), there are other simultaneously resonating meanings which emerge depending on your perspective in the 3D space in which it is modeled and rendered.

From the main point of view—shown in the main animated diagram on spinbitz.net, and above—if you watch the shape of the spinning curve, you see that it continuously morphs, oscillating between an S and a Z. The polar capitalization in the title, SpinbitZ, recall, stands for the interface between the philosophies of Spinoza and Leibnitz (more commonly called Leibniz), the two main rationalists in Nondual Rationalism. The symbiotic polarity found between their work is embodied in SpinbitZ, and in this animation morphing between the curvilinear S and the rigid pointy Z, denoting the polarity and triune-integration of their continuous and the discrete aspects of the absolute, respectively. See Figure 49, below.

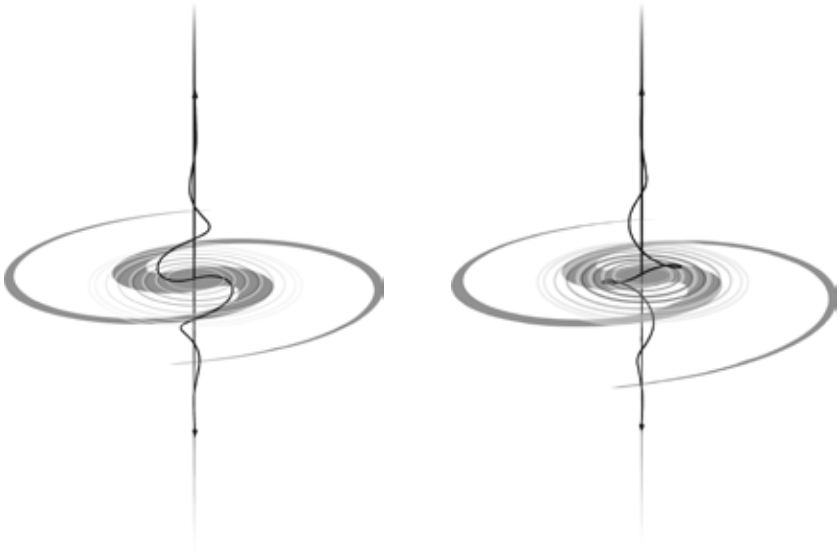


Figure 49: SpinbitZ <– S-Z –> :
As it rotates, the curve of the animated SpinbitZ diagram morphs, oscillating between the S and Z, of Spinoza and leibniZ, as seen from the default perspective just above the central plane.

Furthermore, another, more playful meaning is found in the core SpinbitZ diagram, but this time based on a different perspective of the same volumetrically extended ("3D") form. At the top of the SpinbitZ web page, on either side, it shows a bottom view of the same spiraling curve as it morphs, oscillating between a yin-yang sign and an infinity sign or lazy eight (Figure 50-A and -B, respectively). This shows the inherent morphological similarity between the yin-yang and the lazy eight, symbolizing the polarity (nonduality) in the positive infinity of Nondual Rationalism between the absolute and the relative, or between Emptiness and form, essentially.

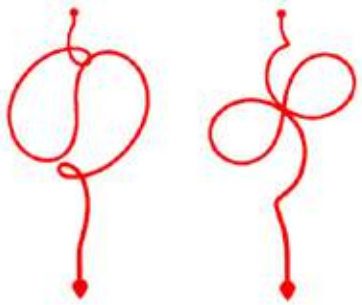


Figure 50: SpinbitZ Yin-Yeight:
The morphological unity between the yin-yang and the lazy-eight in the core SpinbitZ diagram, arising from different rotations of the same 3D curve from a perspective closer to the poles than to the central transitive plane (below, or immanent to the plane, in this case).

The Saw-tooth Curve of Iopol Inversion in the Evolution of Number and Operation

We can also take a global look at this embryogenesis of mathematics from the standpoint of number as it unfolds in function from new, recursive levels of operation, particularly with the input/output polarity reversal of the default agglomerative operations, addition, multiplication and powering. See Figure 51, below.

Note that only the first *agglomerative* operation, addition, opens up a new function of number (the Naturals and wholes), while every successive new function of number emerges explicitly only with the iopol inversion of the new agglomerative operation into deglomerative or *immanent* function with the successive breakings of closure, such as that with the integers and the operation of subtraction, as well as that with the Rationals and the operation of division. In this sense, the symbiogenetic transcendent ratcheting of number and operation can be seen as a reaction to the trans-bias itself, as the mechanism with which it breaks new ground with every new turn is always toward immanence, ending, finally, with the implicit immanent singularities of the irrational numbers, breaking into full immanent infinity itself through the function of rooting.

Recall our repeated inset from Figure 50, above, where the evolutionary path of number is outlined as it moves from the default transitive mapping of transcendence in additive agglomeration and the naturals, into the successive violations of closure in the iopol inversions of the corresponding levels of agglomerative recursion. An intuition generated with these two curves in mind should get us closer to a visualization of the actual n-dimensional structure.

Note also that both the irrationals and imaginaries break out into the open with the level of roots, as it moves finally and fully onto the uncountable I/T axis, breaking the bonds of the trans-bias and in the process—in the default operational context of the extant pre-rational Cartesian transitive rectilinear grid—the imaginary axis and many of the prevailing irrational constants of physics and other sciences are seen as the aftermath of this incomplete interface and transition, not yet fully operationalizing the I/T axis intrinsic to the level of the rational and the higher-level functions of number, such as division and rooting. Recall also that the model of Synergetics was briefly introduced as an example of an intrinsically rational and four-dimensional model—with a more fully operationalized and integrated I/T axis—in contrast to the three-dimensional, pre-rational Cartesian coordinate system. It may well be true that there are other candidates, but these have yet to be seen by this author.

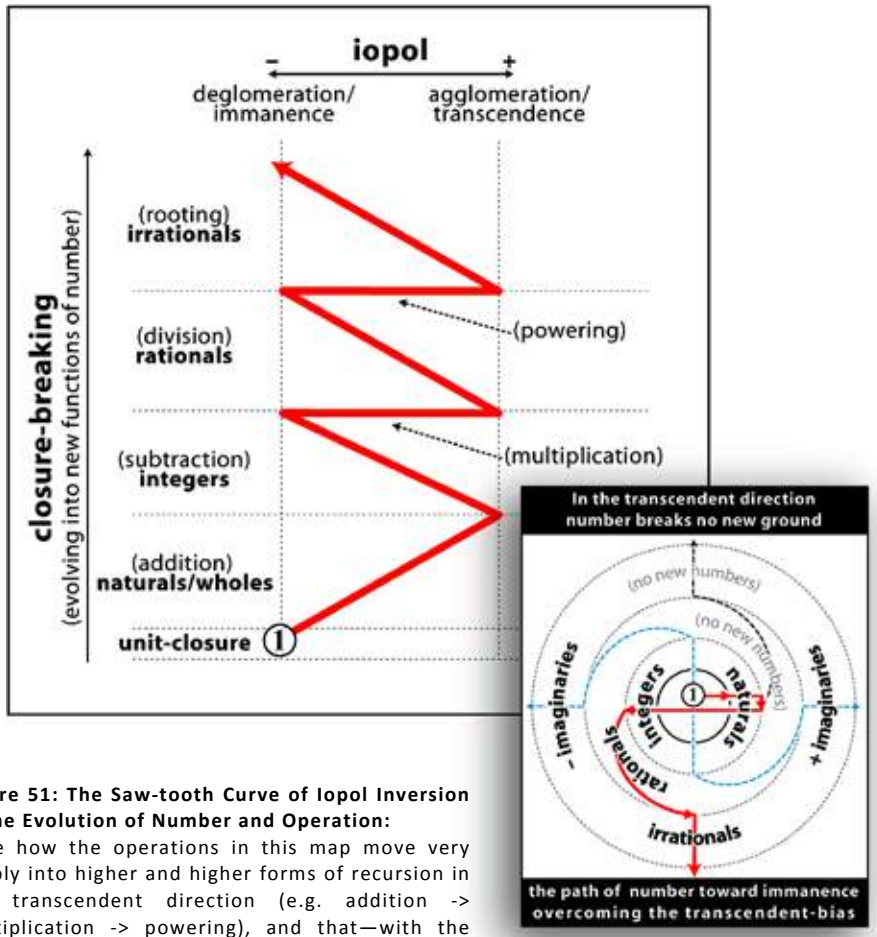


Figure 51: The Saw-tooth Curve of Iopol Inversion in the Evolution of Number and Operation:
Note how the operations in this map move very simply into higher and higher forms of recursion in the transcendent direction (e.g. addition -> multiplication -> powering), and that—with the exception of the very first function of unit-addition, generating the naturals—number is only broken into new functions (breaking of closure) with the move toward deglomeration and immanence in the iopol reversal of the next new level (e.g. subtraction generating the integers, division generating the Rationals and rooting generating the immanent singularities of the irrationals). Contrast and compare this curve with the repeated inset from Figure 47 above (p372), for a more complete intuition as number and operation work their way out from the default, pre-rational trans-bias.

THE BINARY CYCLE OF IDENTITIES, AXES AND UNITIES

Recall, that there are only two VL-axes in the Vision-Logic Coordinate System. And recall also, from the section *The Orthogonality of Inverses and the Offset Origin-Identities* (p339) that the origins and operational-identities of each of the VL-axes are identical, and thus we call them origin-identities; i.e. the additive identity is *zero* precisely because it is the origin (or center) of the transitive-axis, and similarly, the multiplicative identity is *one* precisely because it is the origin (or center) of the I/T axis.

Notice as well that the power/root level has no new origin-identity or axis of its own, but appears to have simply integrated its use of the previous two origin-identities and VL-axes. This integration can be seen in the fact that graphed curves of powers (which have no transitive offsets), always go through both zero and one. At the power/root level, recall, only the odd integer powers of *x* reveal the identity line—the image of the trans-bias in the transitive mapping of transcendence—as their basis. Also, there is an infinite favoring of the intensive forces seen in the purely agglomerative/intensive quadrant of the rational, non-integer powers (expressible as roots) as well as in the multiplicative/agglomerative absolute value line (reflecting off the *x*-axis back into *y*-positivity) as the basis of the even integer powers. (Recall Figure 38, above, The Trans-Trans Instability: p347.)

What then is the relation between these two VL-axes, their countable and uncountable infinities, their origin-identities and their unities?[i] The transitive and immanent/transcendent origin-identities, 'zero' and 'one' respectively, can be seen as symbiotic or interdependent (polar) functions of one another in the interplay between the two VL-axes in the continuation of the Cycle of Unity in the unfolding of mathematics into higher and deeper levels of operation and number.

The I/T uni-axis (the ONE-one axis),[ii]* recall, is the pole between uncountable infinity in its transcendent vs. immanent directions with

[i] We'll explore in great detail the interface and relation between the uncountable and countable infinities of the two VL-axes in the section on Zeno's paradoxes. See, To Infinity and Beyond: Tuning and Triuning the Paradox, p432, and the subsection, Back to Zeno, p448.

[ii]* See, The (Binary) Cycle of Unity, p254.

respect to a *unitary* position. In the very "center"[i] of these two endless omni-directions is the arbitrarily defined interface and unit-magnitude—the number 'one'—the periapsis in our Orbit of Unity,[ii]* and the origin-identity of the I/T axis of multiplication and division. In the first phase of this unfolding of the cycle of origin-identities, the immanent pole of this Infinite Unity is the origin and operational identity of the countable and stepwise (agglomerative) transitive-axis as it converts the I/T interface into the finite unity and primitive number *one*. This is the interface between the I/T and transitive VL-axes, as this first boundary from the boundless is then both the *unity* (or unit) of the *transitive* (additive), and the origin and operational-*identity* (origin-identity) of the *immanent/transcendent* (multiplicative).

On the transitive axis, however, once the unit has been defined for additive operations, it is the *absence* of any unit—our transitive-zero as negation—which is the identity, thus bringing us back (even if from a transitive viewpoint) to the immanent pole of the I/T axis as origin in the creation (and inversely as the negation) of the first unit. The rational zero as immanent-positional aspect of The Infinite—through the Principle of Absolute Reversal, the Principle of Immanence in Transcendence (yin in yang) and the identity of opposites—then reflects into its identical opposite, the ONE, our Infinite Unity. This returns us full-circle, dissolving the initial boundary-division of relative polarity, our finite unity, back into absolute or Infinite Unity—dissolving the one (as the interface of the ONE-one in the Cycle of Unity) back into the ONE-ALL—and dissolving our primitive number-as-boundary and dimension back into infinite omni-non-dimensional continuity. See Figure 52, right.

Figure 52: The Binary Cycle of Origin-Identity and Unity:
The unity of each axis (I/T and transitive) is the identity of the other, and vice versa.

[i] …every boundary is in the exact center of an infinite axis, whether it be that of the number-line or that of infinite divisibility and the absolutely indivisible continuum. In the infinite, the "center is everywhere and [the] circumference nowhere."

[ii]* See, The Orbit of Unity, p260.

The multiplicative identity and finite unity, "one," originates from the primary VL-axis of dimension and Infinite Unity (the I/T axis) as the first act of dimensioning, whereas the additive identity "zero" dissolves the boundaries of the unit-number and fades back into the implicit singularity of the rational zero, reflecting through the PAR into Infinite Unity, completing the circle, and triuning (or tuning) the polarity from Unity to finite-unit-identity to Unity. The Unity of one level is the identity of the next, leading us one into the other, between the finite and infinite forms of unity and identity.

The cycle is from unity to identity to unity. The unity of one level becomes transcended-and-included as the identity of the next. But given that there are only two VL-axes, two origin-identities and two unities, it cycles in and out, off and on, from the absolute to the relative to the absolute; from zero, to one and to zero again; and from I/T to transitive to I/T. But, recall, when it is at zero, through the Principle of Absolute Reversal and identity of opposites, it is at ONE, so it also cycles from ONE to one to ONE. Our Cycle of Unity *is* our cycle of origin-identities, refracting into the prism of the artifice of pure relation called Mathematics.

The immanent/transcendent and absolute unity is ONE, whose immanent and operational pole is the rational zero. The transitive identity, however, is also zero. In this sense, the transitive axis and relative scope sees the ALL is ONE (in its immanent aspect) as "all is none": the omni-non. Within the relative scope of transitivity, the absolute or Infinite Unity is invisible and inoperable, the cipher, the absence, our common notion of emptiness, providing the inert identity of the transitive operations of addition/subtraction. The *Unity* of the initial Immanent/Transcendent axis is therefore the operational *identity* (or null) of the transitive axis which transcends-and-includes it.

The transitive *unity*, that is derived in this process of unity-to-identity conversion, is 1, which will be written as (1) to remind us that it represents a volumetric, or spheroidal, bounded and finite unity. The rational or multiplicative *identity* is also this same (1), which is now transcended-and-included from the transitive unity as the solidus between the I and T of the I/T axis. We will represent the rational *identity* herein as /(1) to remind us that the transitive-unity (1) is transcended-and-included under the hidden solidus of all rational and pre-rational numbers. Any numerical imbalance, balanced on the point of origin, is still that original imbalance.

The immanent/transcendent or rational *unity* is the I/T axis itself, the absolute or Infinite Unity, the unreachable ONE-ALL (ALL = ∞/∞ = ONE) reached by way of the Principle of Absolute Reversal and the identity of opposites. This Unity, in its transcendent form (inverted across the solidus in the immanent position), can be represented by the infinity of division by zero, the rational zero, or /0, which is numerically equal to ∞/1. Transitive operation begins in converting immanent/transcendent Infinite Unity, ONE-ALL, ∞/∞, or /0, to the transitive and finite unity, (1). And this coincides

with the conversion of the immanent/transcendent-unity ONE—represented by the rational zero and the immanent pole—to the transitive identity 0.

The power-/root-level, operating directly on the uncountable Immanent/Transcendent axis, is "second-tier," and integral. As such, it has no new identity of its own, but has integrated both to a new functionality. At this level the unity doesn't become the new identity because we haven't moved onto a new VL-axis. Rather, the hidden or enfolded unit-identity comes into a new functionality. The onion of operations comes into full differentiated-and-integrated view at this 2nd tier. The *dis*-junctions between the shifting of VL-axes come into *con*-junction and the onion of polarities aligns its inputs and outputs into a new harmony in the full circle between the uncountable infinity of the I/T axis, the countable infinity of the transitive, and back again, but always breaking closure *against* the tide of the trans-bias to gain its new identities. We'll see the point of this cycle most explicitly in the section on Zeno's paradoxes.[i]*

We can see here again the primacy of the Immanent/Transcendent axis (Fuller's first dimension) and the primacy of radial and nuclear, convergent and divergent (immanent/transcendent) over parallel (transitive) lines. We can also see the dependence of the transitive and additive operations upon the I/T axis as it returns through the cycle to its source. This whole cycle is a function of the mapping of the immanent through the transitive axes, breaking into new function against the trans-bias. We come to mathematics from trans-biased agglomeration, and thus from the outside in. But through the higher functions of multiplication-by-division, rational numbering, and power laws, we are led—with each successive iopol inversion and breaking of closure—back to the neglected source, the immanent-zero, reflecting through the PAR and identity of opposites to the Infinite Unity of the ONE-ALL.

Fuller clearly recognized this primacy of the hidden immanent, recall, when he talks (in his historic 42 hour "thinking out-loud" session, "Everything I Know") about mankind having come in to mathematics and dimensional/geometrical accounting through "the attic window" of cubic-based geometry and trying to measure the front door based on the dimensions of this odd little attic window.

We are agglomerative beings, fluid architectures of electro-chemical reactions at the spherical surface or (I/T uni-axial) interface of a planet. Thus we are born first into *apparent* transitivity and from there we find our way to immanence in its higher resonances, which predated and prefigured the flat-earth illusion of transitivity. Rectilinearity or perpendicularity is a

[i]* See, Back to Zeno, p448.

subset of the spherical, as a surface or interface effect of our spherical, bounded and finite unity. This is why we so often confuse the immanent and transitive axes, we always have to come down to the least common multiple of human understanding, the "we" criterion for justification and collective "truth." We start from the outside and work inward. When we get there, in a sense we have to turn the whole thing inside out to make sense of it.

Open Question: Can this binary cycle and interplay of origin-identities, unities and VL-axes be seen in the properties of odd and even numbers, with odds as one-of-a-kind entities and evens composed of identical sub-parts or halves? We can see this cycle and the role of the odds and evens more clearly, perhaps, in its interface with the asymmetries of multiplication by like and unlike signs, the trans-trans instability, and the differences between odd and even integers.

FUNCTIONS AND GRAPHS FROM THE SECOND TIER

From the transcend-and-include vantage point of the second tier in our vision-logic interface, we can take a fresh look at the holarchical unfolding of number and operation through another visual interface, that of the graphs of functions. This, then, will be the interfacing between two percept-based interfaces; the graphs of functions and the holarchical model of Interface Mathematics. In the true, nondual function of an interface, each component sub-interface will inform or illumine the form and function of the other. Through the concept of the function, we will take a closer look at our onion of operations, as it unfolds through the power-root level and into the exponential/logarithm level. Then we will employ the model of Interface Mathematics to the understanding of graphs of functions and see how each informs the other.

Unpacking the Onion of Operations

As we have seen, the transcend-and-include holarchy (embryogenesis of the concept) of number and operation (as well as identity, origin and unity) unfolds as a cycle, mirroring the cycle of integral transcendence, from pre-operational immanence (or pre-cognitive emergence) into the transitive mapping of transcendence, and against the current of the trans-bias to return ultimately to the originary immanence (yin) in balance with transcendence (yang). At the higher levels, the initial, undisclosed and unrecognized pre-mathematical VL-axis of freedom (the I/T axis of initial scale) becomes more and more operationalized in the integration of the previous transcended-and-included levels. It moves from immanent/transcendent ALL is ONE—with its nondual, pre-operational, intensive and inter-expressive forces—to the first operations of transitive oppositional positive/negative duality (absolutized platonic categories, unit-identity, numerical identities, etc), and then progressively back to operationalization of the nondual intensive forces of the rational and power/root I/T axis with its hidden and implicit immanence.

This conceptual journey also moves from *omni-non*-dimensional and uncountable ALL is ONE, through the I/T uni-axis interface (the omni-symmetrically bounded (spherical) unit-identity) to the *uni-/multi*-dimensionality and merely countable infinity of the agglomerative transitive axis and then—with the breaking of unit-closure—transcending-and-including into the operations of division/multiplication and finally back

home, full-circle, to the integration of the uncountable I/T *and* countable transitive axes, but now fully operationalized as the power/root level with its explicit singularities in the form of "irrational numbers," and with the remainder-axis of the imaginary.

In the transcendent direction, mathematical operations transcend and include their predecessors in a simple self-complexifying holarchical loop of recursion; taken in reverse, powering is recursive multiplication which is recursive addition, which is dependent on the recursive agglomeration of ones to form the set of digits (our mathematical titans) in the first place. With each level of recursion, however, we find another level of operational input/output polarity which can be inverted, and each time this occurs this gives us a new level and function of number, breaking the closure of the previous set and moving us into a new one, always closer and closer to an operational return to the pre-operational and neglected immanence of the I/T axis, against the default current of the trans-bias as seen in the identity-line. This transcend-and-include motion we have seen simply with the rules of the exponents where to operate on the base at one level, we use the operations of the previous level. And with our Saw-tooth Curve of Iopol Inversion (p379), above, we saw what this looks like in terms of in the evolution of number and operation ever toward immanence, against the trans-bias.

The Cartesian Axes and the Image of the Trans-bias

As we have seen,[i]* the juxtaposition of the graphs of the identity-line, *y=x/1* and the "inverse-identity-line," *y=1/x*, reveals the trans-bias in stark relief (See Figure 26, repeated below, from p315). The infinity of integers on the transitive axis contain the hidden or pre-fused division by the transitive unit or "multiplicative" (rational) operational- and origin-identity. Thus they are closed through unity, in the immanent direction, i.e. "quantized" into unit values by the inverse unitary division implicit in the unfolding multiplication (closure property of the integers, and the numerical identities transcended-and-included in the naturals). By default, the infinite x-values are in the transcendent position of the ratio, and the constant rational identity, the closure-factor, is hidden in the immanent position, in relation to the invisible solidus. Therefore, the default, implicit, transitive mapping is a one-to-one function with the transcendent pole of the I/T-axis, and we get the identity line *y=x/1*. Take the reciprocal *y=1/x*, however, the inverse mapping, and the hidden rational identity comes into relief. This is why, of the twin rational operations (division and multiplication), only division violates the closure property of the originary unit-identity, (1), refusing to take us into the opposition of the negative transitive numbers, but rather taking us directly

[i]* See, The Image of the Trans-Trans-Bias, p312.

and naturally into the infinite hidden 'space' *within* the unit-identity (the intensive univocal forces of the positive infinity of the rational) and *between* each rung of the transitive/transcendent ladder.

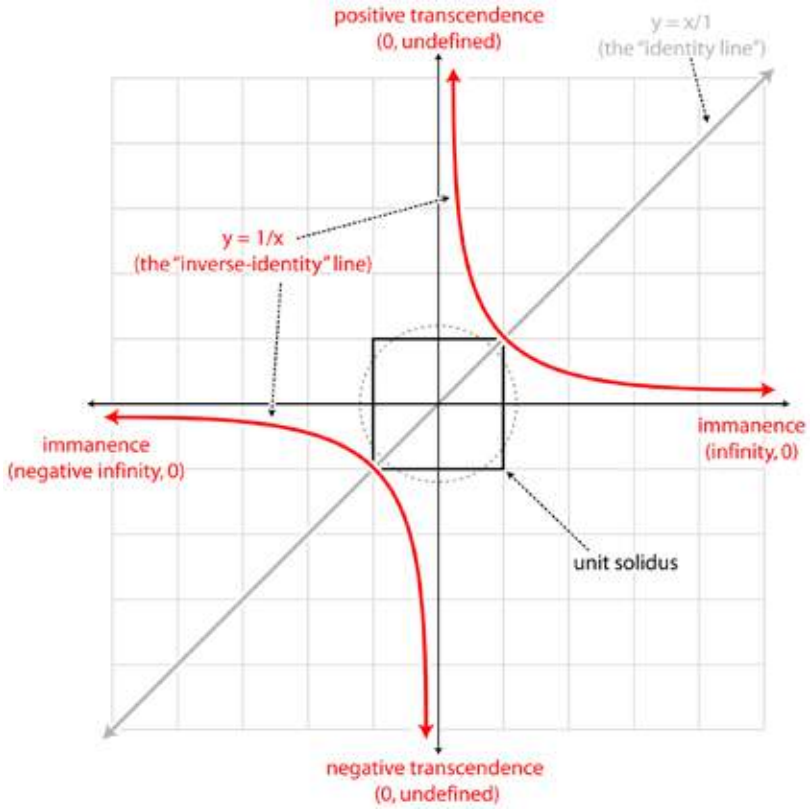


Figure 26: Repeated from The Image of the Trans-trans-bias.

Through transcension-and-inclusion, the transcendent pole, at the level of the rational, is tied to the transitive unit, the "multiplicative identity" that makes the identity line possible, and renders the immanence of the root unit ubiquitously invisible from within its frame of operation. Division, however, comes from the inverse direction, from the other side of the transitive agglomerative recursion of multiplication, across the input/output polarity. Division starts with the output sum as input and works back to find the

expanded solidus that fits the recursive ratio. This is how it breaks the closure of the unit-identity quantizing the integers.[i]*

In this way division (rationality) includes and vastly transcends the hitherto transitive, agglomerative and pre-rational functions of addition and its recursion layer of multiplication. By inverting the quantizing process across the input/output polarity, and violating closure with the unit selection in the output rather than a hidden input, division reveals the I/T axis hidden in the invisible unit-divisor of the integers and upon which the unit was initially (even if unconsciously or pre-operationally) selected.[ii]* And, as we have seen, the asymmetry of the closure property, with the iopol inversion always breaking closure toward immanence, directly demonstrates the trans-trans-bias.

It is only natural that the transitive axes were initially mapped to the transcendent operations encapsulating the trans-trans-bias in the transcend-and-include holarchy of mathematics. This is, after-all, a natural objective-bias inherent in sensorial and conceptual operation, and therefore in mathematical evolution. This image of the trans-bias illuminates why the *trans*-cendent and *trans*-itive collapse into the one-to-one identity of the common mathematical notion of "the infinite"—mapped as the identity line—and reveals precisely why the immanent pole of the Immanent/Transcendent axis, represented on the immanent side of the solidus, gets thrown in the waste-bin of the "undefined" and identified with the cipher. As we can see on the graph, even the unit-identity itself, the root trans-unit that got the ball rolling, is invisible from the trans-trans identity axis and from multiplicative functions, whereas in the inverse-identical operations of division, and even in the power/root operations, the curves frame the implicit unit-solidus clearly. From the default trans-trans view, the immanent pole appears as but an infinitely insignificant spec on the straight path from one side of (trans-)infinity to the other. The trans-trans line crosses an infinity of them with every interval, without batting an eye.

However, this infinite insignificance of the immanent axis, marked by a zero in the "undefined" divisor, is an infinite oversight. The physicists of the 20th century found this out the hard way, stumbling in the dark of pre-rational meta-mathematics, tacitly assuming the inert nullity of their "point-particle approximations." Many still haven't figured out how and why their "cipher in the snow"—the implicit singularity of the immanent location-aspect of *The Infinite*—manifested its infinite energy, but we have seen, through the Principle of Absolute Reversal, just how this can happen.

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[i]* Recall, Phase FOUR: Transitive Interfacing with the I/T Axis, p324.

[ii]* Recall, Phase TWO: Unit-closure and the Finite Unit-Identity, p308.

The Implicit Iopol of Function Operations

There is an apparent asymmetry between input (*x*) and output (*y*) in function offsets, where changes to *x* shift in the inverse direction from those on the *y* (output) axis. For example, the equation $y = f(x+3) + 3$, we see that $x+3$ shifts the output a *negative* 3 units on the *x* axis. This leaves $y = \ldots+3$, which shifts the output, *y*, a *positive* 3 units, i.e. on the *y* axis. This apparent asymmetry is exactly that, apparent. It is a necessary function of operationally *seeing* only one direction (trans-trans), from input to output, in the implicit iopol of function operations. It is this same implicit polarity that remains hidden, but still operative, in the initial agglomerative "onionOp" layers of addition/subtraction and the recursive-addition of multiplication.

Looking for Holes in the Rational Functions: Locating Asymptotes

The rational function—operating at a key position in the EOTC or onion of operations—provides a unique opportunity to explore the onion of operations in the explicit visual fashion afforded by functions: graphs. And conversely, the onion of operations allows us to make much more sense of the terrain of the rational function, generally only known to the abstraction of symbol-manipulation or calculation. In this interface of the onion of operations with the rational function we will see that each informs and reveals the other. This shows up clearly in the procedure for locating the asymptotes of rational functions—our limits in the unlimited where number breaks into its originary, pre-operational identical opposite: infinity.

An asymptote is, essentially, a region where the relative curve escapes into the scope of the absolute, having no final bound. They are "holes" in the graph of the relative, leading into the absolute. The images of these holes provide a snapshot of the particulars of the relative function itself interacting with the polarity of VL-axes, the transitive (mapping the transcendent in the trans-bias) and the immanent/transcendent.

A rational function is simply one polynomial function divided by another. There are two types of asymptotes for rational functions; vertical and horizontal. A vertical asymptote is where the value of the function, or the value of *y*, ultimately escapes in the transcendent direction towards positive and/or negative (transitive as opposed to immanent) infinity. A horizontal asymptote, on the other hand, is where the hidden immanent pole of the Immanent/Transcendent axis comes into play, shunting the transitive mapping of transcendence into the deep-infinity of immanence, as it is opened up in the function of the ratio.

We can see quickly that any value that brings the denominator—the immanent position in the rational function—to zero, will give us the pre-

rationally *undefined* infinity in the immanent position of the rational I/T axis—the rational inverse of zero. Therefore the locations on the graph where the value of *x* leads to the cumulative value of zero for the denominator will result in vertical asymptotes. For example, with the equation *f(x) = 1/x*, the vertical asymptote would simply be the vertical line running through *x = 0*, or the *y* axis, because zero in the denominator equates to infinity for the value of y. We have already encountered this simplest rational function in the inverse-identity line, see Figure 26, repeated above. As the values of *x* approach zero from either side, they extend vertically to infinity, currently "undefined" in the default pre-rationality of the Cartesian trans-biased graphing system.

The horizontal asymptotes, however, are much more difficult to find, especially in more complex rational functions. We will trace out a modification of the standard set of procedures for locating the horizontal asymptotes of a rational function. Ultimately the asymptotes are defined by the ratio of the degree of the polynomial—i.e. the *maximum* power of any of its terms—on either side of the solidus of the rational function—because the maximum power will always overtake any smaller powers on the endless road to The Infinite. And again, through the "second-tier" integration of the power/root level, we will find a clarity on the entire holarchy of number and operation as it unfolds through the lens of the rational function.

To find the horizontal asymptotes of a standard rational function, we can take ***n*** for the degree of the ***n***umerator, ***m*** for the degree of the deno***m***inator and use the following set of rules. However, we will emphasize our mnemonic, ***n*** for tra***n***scendent and ***m*** for i***mm***anent, for obvious reasons. And to keep things simple, we will symbolize the degree of the polynomial with the power of *x* — *x* simply stands in for the polynomial itself, to which we can emphasize its degree.

The Immanent Function

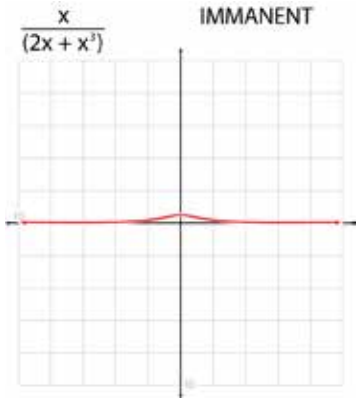

Figure 53: Immanent Function: A rational function ending (unendingly) in an immanent operation.

e.g. x^1/x^3 — *n* < *m* — If the tra***n***scendent degree is less than the i***mm***anent, the horizontal asymptote descends into the rational-zero of the x-axis. This is called, herein, an immanent operation because the immanent side of the ratio ultimately overpowers the lesser transcendent. The ends of the curve, representing the over-riding power of the function, enter into immanent operation through eventual over-powering on the immanent side of the solidus. And, on the trans-biased Cartesian graph, since immanence (yin) is "undefined" and invisible, *y* simply moves toward *zero*. This is directly analogous to the motion toward zero as the denominator of a ratio approaches infinity. Since negative numbers are a function of the transitive axis and therefore of pre-rational functions, and zero is the immanent pole of the I/T-axis, the curve forever "approaches" the non-limit of immanent-zero, rather than crossing into the "imaginary" land of negative numbers.

The Balanced (Rational) Function

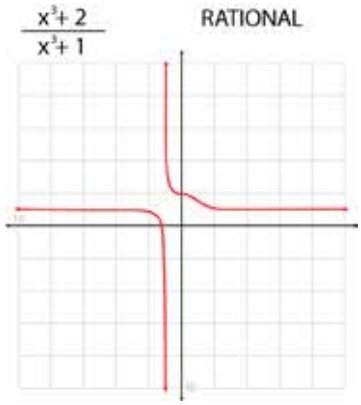

Figure 54: Balanced (Rational) Function: A rational function ending in a rational operation.

e.g. x^3/x^3 — *n* = *m* — If the tra***n***scendent degree is *equal* to the i***mm***anent, however, the powers drop off, as far as the asymptote is concerned, and we have an asymptote defined essentially as the expanded/contracted solidus of a rational number. The asymptote then becomes the ratio of the coefficients of the largest powers of the polynomials of the numerator and denominator; the line *y* = ***nc/mc***. This operation is ultimately defined as rational because when the ultimate powering is balanced across the solidus, at the ends of the curve, (at the unreachable absolute scope) the

power/root onionOp shell of the exponents is *ultimately* negated and we move one level down to the mult/div, or rational shell, forever "approaching" a rational number as constant, as opposed to approaching an over-riding power curve. The asymptote here represents the infinite depth at the root-unit interface expanded or contracted through the rational solidus.

The Trans-Trans Function

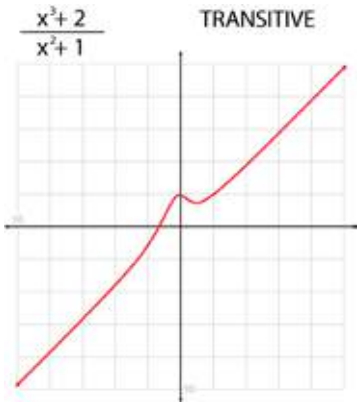

Figure 55: Trans-Trans Function: A rational function ending with a trans-trans operation (mapping the trans-trans identity line of the default trans-bias).

e.g. x^2/x^1 — *n* = *m+1* — If the tra***n***scendent is *exactly one* degree greater than the i***mm***anent, then ultimately—as far as the asymptote or absolute scope of powers are concerned—the power of the denominator is negated leaving one power of *x* on the numerator. This leaves us with the trans-trans identity-line, $y = x^1$ — often scaled (skewed) or offset by the particulars of the equation — as the grand power and asymptote of the function. The graph of such an equation is said to have a "slant asymptote" rather than a horizontal one. The slope of the slant asymptote is found using division and dropping the remainder term. The operation here is called trans-trans because the ends of the graph approach the ***trans***itive mapping of the ***trans***cendent pole in *y=x/1*, the transitive identity line. Note that the trans-trans operation has exactly one unit of power, in the transcendent position, showing us clearly its **transcendent bias**, as opposed to the rational operations which come about through a balance of powers across the solidus of the rational function.

The Transcendent Function

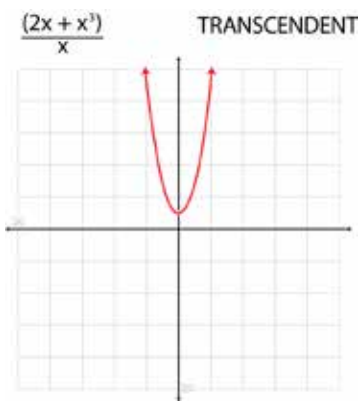

Figure 56: Transcendent Function: A rational function ending in a transcendent operation.

e.g. x^3/x^1 — n > m+1 — If the tra***n***scendent is *more than one* degree greater than the i***mm***anent, then, it has no horizontal asymptote. This is called a transcendent operation because the ends of the curve have moved into the positive and/or negative transcendent vertical directions, approaching no line, horizontal or vertical as asymptote. And hence the I/T infinity can be mapped to the transitive infinite y-axis rather than approaching a constant within/between the transitive number-line, the hidden immanent pole represented by the h-asymptote.)

Note that if the ratio, *n/m*, is greater than the transitive (root) unit 1, the equation does not enter into immanent operation and it has no horizontal asymptote, i.e. the output does not approach the zero of immanent infinity (the immanent operation) or the immanence between any other y-offset of an expanded solidus (the rational operation). Instead, the graph moves into the transcendent direction and increases and/or decreases through mapping the transcendent to the positive or negative transitive infinity. But if the degree of *n* is *exactly* one greater than *m* we find the slant asymptote of the identity line. This one degree offset in the transcendent numerator is another clear view of our trans-bias, in the transitive mapping of transcendence of the trans-trans identity line. If the ratio of degrees is balanced, however, the immanent and transcendent are in harmony and we move onto a new VL-axis with a new origin-identity and into the intensive forces between the poles of the rational immanent-zero and the transcendent infinite. The horizontal asymptote in this case is the ratio of the coefficients of the degrees, representing the rational expansion or redefinition of the unit-solidus (breaking the closure of the unit-identity through the iopol inversion offered by opening up the hidden immanent side of the ratio to input). If, however, *n/m* is less than one, the horizontal asymptote is the *x*-axis and we move back into undefined hidden immanence, shrinking into the sub-representational zone of the *x*-axis itself, an infinite dimension hidden behind a thick line of pre-rational ink.

Our modern graphs are transitive and trans-biased (yang-biased) in nature, in the default, pre-rational Cartesian space of modern meta-mathematics. Because of this, the infinities of the immanent pole (yin) generally take the form of asymptotes or undefinables; the infinite depth

horizontal asymptotes between numbers in unquantized inter-unity divisions, or the "undefined" vertical asymptotes of the immanent zeros in the denominator; these zeros being the immanent identity on the immanent side of the rationally expanded or contracted unit-solidus.

Embryology Through the Exponent and Logarithm

Unfolding in accord with the EOTC, the level of powers has enfolded within it several different input/output polarities. At least two of these polarities can be inverted at this level to give us a new function or operation. Recall that enfolded at the level of multiplication and division is the immanent/transcendent polarity of the solidus/vinculum. This is the polarity that—at the offset level of the exponent—is inverted from its default agglomerative function to give us the function of rooting (See Figure 57, below). We have seen this already in the rules of exponents as demonstrated in the Onion of Operations, above, where taking the reciprocal of the exponent (flipping it across the solidus) inverts the operation into taking the root of the base.

Another iopol open for use at the power/root level, however, unfolds because the level of powers is the first level of operation explicitly recognized and operationalized as a function. This explicit operationality is provided with the role of the exponent, and is the reason that this level is considered "second-tier," because it exposes and operationalizes its own transcended-and-included polarities.

At this level, then, we can differentiate between two types of function; the power function and the exponential function. Both of these functions use the same underlying operational form of layered recursion, which we have already explored at length and which we visualized in the diagram of the onion of operations (recall Figure 37 above, p345). The power function, we have already seen, simply takes the input variable *x* (which we will call the domain input, to emphasize that *x* is the input of an entire domain) as the base, and raises it to the arbitrary *single* input number *n*; e.g. x^3. The exponential function, on the other hand, takes the arbitrary input number *n* (a single number rather than a domain) as the base, and raises it to the variable domain-input *x*; e.g. 3^x.

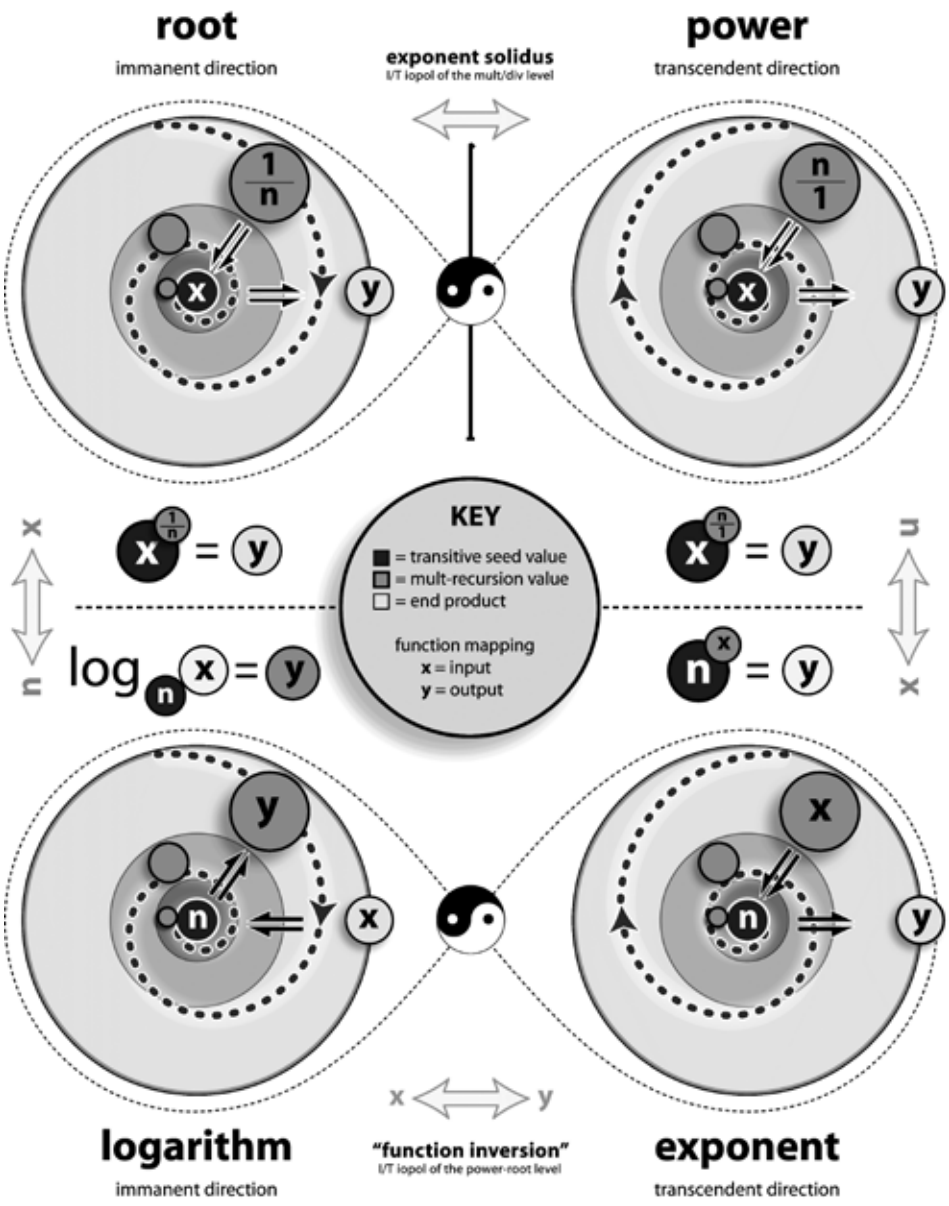

Figure 57: Powers, Roots, Exponential and Logarithmic Functions and the Input/Output Polarity:
The trans-rational or power level has a singular, transcend-and-include, holarchical structure of inputs and outputs. It is the differential mapping of these input and output structures to the various aspects of functions, such as the domain-input of the *x*, and the single-input *n*, that allows for the new operations of the logarithmic and exponential functions. Notice how switching the position of the *x* and *y* (input/output of the function, reversing the direction of the arrows), in the bottom section, converts between exponential and logarithmic functions, whereas merely taking the reciprocal of the exponent, in the top section, converts between power and root operations.

The key difference at this point, then—at this *very same level of holarchical structure*, which we can map out visually (see Figure 57, above)—is where the *x*, *y* or *n* is placed, and this in turn determines the directions and flows of the various inputs and outputs emerging at this level of the EOTC of number and operation. Notice how switching the position of the *x* and *y*—the input/output polarity of the function—in the bottom section, converts between exponential and logarithmic functions (reversing the direction of the arrows), whereas merely taking the reciprocal of the exponent, in the top section, converts between power and root operations.

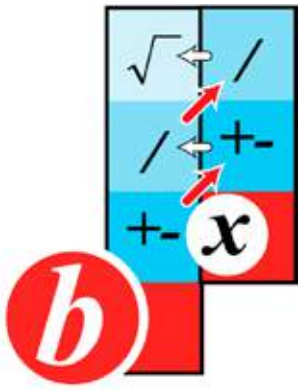

Figure 58: The Onion Offset:
The offset of polarities in the onion of operations. [Adapted from the inset of Figure 37, the Onion of Operations (p345)]

In the power function the *x* is placed in the transcended-and-included rational level of the base and in the exponential function it is placed in the trans-rational level of the exponent, with its offset polarity mapping. And so the iopol of powers operates at the rational level of the transcended-and-included solidus, whereas the iopol of the exponential operates at the trans-rational level of the exponent, and this easily and obviously accounts for the differences between power-root and exponential curves, where an exponential/logarithmic, will always overtake a power/root curve.

This new input/output polarity afforded first by explicitly operationalizing the powers through the use of exponents, and secondly by treating the power/root level in terms of functions with variable inputs and outputs which can be swapped around, then allows the inversion of the function of exponentiation to give us the logarithm. The key difference between the root and the logarithm, then, is where, in the holarchy, this iopol inversion takes place.

Unpacking the Onion: Expanding Logarithmic Functions

The two transcended-and-included polarities of the power level, recall, are the oppositional forces (+|-) of the transitive axis and the intensive forces of the I/T. The I/T is mapped to the rational polarity of the exponent itself, toggling by reciprocating it between the power and root operationality across the square-root line (e.g. 5^2 becomes $5^{½}$, or $\sqrt[2]{5}$). And the transitive +|- polarity on the exponent toggles its base across the rational solidus (e.g. $5^{-2} = 1/(5^2)$).

We can see this very clearly in the rules of logarithms and exponents. Indeed, expanding logarithmic functions can be seen simply as unpacking the onion of operations, working in the reverse direction to the transcension-and-inclusion of number and operation itself and unfolding the enfolded evolution, mapped to the offset polarities of the exponent.

For example, as we would expect with the operational offset in the onion of operations (See Figure 58, above), in the power rule — $log_b M^p = p\ log_b M$ — we can simply choose to take the exponent (p) out of its trans-rational, exponential level, and bring it down into its functional equivalent at the rational level of multiplication or division, as mapped by the offset polarities of the exponent in the onion of operations. This offset which we are now *deconstructing* or "expanding," recall, we simply *traversed* with the laws of exponents, where taking the reciprocal of the power (flipping it across the implicit unit-solidus (/1) of all rational numbers) inverted the power into its root.

Similarly, the product and quotient rules — $log_b MN = log_b M + log_b N$ and $log_b M/N = log_b M - log_b N$, respectively — traverse the onion-offset of exponent polarities at the next deeper level of the transitive operations of addition and subtraction. The product rule can be stated simply: *when logarithms of the same base are multiplied, the base remains the same, and the exponents can be added*. We can see this quite directly using exponents: $3^5 \times 3^3 = (3x3x3x3x3) \times (3x3x3) = 3x3x3x3x3x3x3x3 = 3^{5+3} = 6561$.

The inverse of the product rule, the quotient rule, is similarly illustrative. It can be stated simply: *when logarithms of the same base are divided, the exponents must be subtracted*. So using the logarithm again, we can unpack the onion still further with the factors, or multiplication *within* the resultant equivalence to addition of recursive elements at the level of the exponent. This allows us to separate the *internal* (rational) factors of the resultant through the *external* (trans-rational) operation of addition or subtraction offset through the onion of operations. We can then use the iopol inversion of the logarithm to deconstruct the onion of operations, to replace the exponents, with their offset polarities and operations, through their functional equivalents, unpacking the onion through logarithmic expansion.

The Trans-Rational: Ontogeny Recapitulates Phylogeny

Power/root functions operationally revisit both the transitive and rational identities, zero and one respectively. This is due to the "second-tier" transcension-and-inclusion of the binary cycle of origin-identities in the power/root shell, the third level in the onion of operations—from the additive identity 0, to the implicit multiplicative identity 1, now explicitly integrated to the unit-identity of the power functions in $n^0=1$ — note that this expression includes and integrates the binary pair of operational origin-identities, zero and one. Thus the cycle comes full-circle and the power/root level makes explicit, or unfolds, what was implicit; from immanent zero, the transitive identity, to the generation of the transitive unity (1), the rational identity, finally embodied or unfolded in the unit-identity of the power/root functions. The exp/log functions operationally embody the whole sequence. So, unfolded in the exp/log functions we find the entire holarchy manifested, because the whole thing is recursively transcended-and-included to create the power/root functions. And so again we find that "ontogeny recapitulates phylogeny," a natural feature of transcend-and-include holarchical evolutions, such as the EOTC. Thus the onion of operations demonstrates the embryology of the core elements of Interface Mathematics.

RECONNECTING THE LOST THREAD OF MATHEMATICAL RATIONALISM: SPINOZA, LEIBNIZ, IMMANENCE AND THE CALCULUS

Leibniz would have nearly completed the opening stages of nondual mathematical Rationalism and opened the way for Interface Mathematics, had he further elucidated the understanding of the three infinities he received when he secretly copied down and studied Spinoza's infamous *Letter XII* on the infinite.[i]* He had rendered the part-whole paradox of Galileo moot in his complex and difficult to grasp system of "metaphysical points," but he failed to see and implement the new VL-axis of the Rationals and thus to build a bridge, making visible and visceral the essence of mathematical rationality. And hence the Zenonian-seed of immanence,[ii]* this uncountably "deep-infinity," this "secret of the rational" was overlooked and trampled underfoot, laying dormant until perhaps this extended moment.

This work indeed picks up where Leibniz and Spinoza left off with their embryonic foundation opening up and operationalizing the immanence of the Rational. We will see this explicitly in Leibniz's calculus as the mathematical expression of his metaphysics of an infinitely divided [iii] holarchy of substance as monads, and more subtly in Spinoza's infinitely active and modified[iv]* Substance as immanent infinity in polar opposition to his modifications as boundaries; resonating with the Nagarjuna's nondual polarity of Emptiness and Form, respectively.

[i]* See, Spinoza's Triune Infinite, p270.

[ii] Zeno was really the first to explore immanence rationally and logically, and in its uncountable form. See, Back to Zeno, p448.

[iii] …and via the Principle of Nondual Rationality, indivisible…

[iv]* (e.g. folded, using Deleuze's term to simply unite the two)

LEIBNIZ, SPINOZA, THE TRIUNE INFINITE AND THE CALCULUS

The Inception of the Calculus

Though its roots extend into both eastern and western antiquity (India and Greece), the essential elements of the *modern* calculus emerged from the exploding progress of algebra and geometry in the 17th century. With the requisite mathematical pieces finally in place, the birth of the calculus was imminent. This happened independently through the work of both Leibniz and Newton, though it is Leibniz who provided the current notation and terminology (the "science of fluxions" apparently wasn't catchy enough). And, as we will see, Leibniz, with the covert help of Spinoza, provided the embryo of the nondual-rational meta-mathematics to match it and solve its pre-rational philosophical problems, which naturally persist to this present day of the aborted and unfinished project of mathematical rationalism.

The calculus was designed for increasing the depth and accuracy of mathematics in the physical sciences and specifically for dealing with rates of change between the interacting variables of a *continuous* curve. The context of the calculus *is* this continuity and immanent infinity inherent in all "points" of the rational number-line. Indeed, the calculus fails when it encounters a discontinuous function, and the stipulation of continuity is written into the Fundamental Theorem of Calculus itself, as we will see below.

This rational continuity, or the "labyrinth of the continuum," as Leibniz famously addressed it, also spawned the problematic "infinitesimals," which are numbers *approaching* "infinite smallness".[i] The calculus, of both Newton and Leibniz, relied upon these infinitesimals as the key to mathematically dealing with the immanent infinity of division by zero (the rational zero) inherent in its processes.[ii]

[i] …the rational zero and immanent pole of the Immanent/Transcendent axis as seen oxymoronically through the trans-bias…

[ii] Note that the numerical value of division by zero is transcendent not immanent infinity. However, this is directly *because* of the immanent infinity of the rational zero. The breaking through of the unit-closure as the denominator goes below 1 and toward the unreachable rational zero causes the reciprocal increase to infinity in overall value due to the inherent transcendent-bias of the natural numbers.

For reasons we will explore shortly, the critical role of the infinitesimal has since been taken over by the less problematic concept of the "limit," in the 1800's, and it is increasingly described more abstractly by functions today. Behind the facade of these more abstract operations and symbols, however, the problem of the infinitesimal itself remains.

Naturally, the processes at the core of the calculus form a polarity; the "derivative" and the "integral," which is roughly that of analysis vs. synthesis, respectively. These can also be seen in terms of their motion with respect to the Immanent/Transcendent axis. The derivative *approaches* the desired infinitesimal itself, *analytically,* immanently, breaking it down through a process of recursive division. Examples include finding an "instantaneous velocity," which is an attempt to "derive" the slope at a point on a velocity curve to the most precise degree, or smallest scale possible on the Immanent/Transcendent axis. The integral, on the other hand, deals with the infinitesimal in the opposite direction, *synthetically,* or transcendently, as a summation (as Leibniz put it), or an accumulation and integration, of infinitesimals. Examples here include taking the area under a graph of a continuously varying function as a summation and integration of infinitesimal slices. These two processes are indeed the inverse of each other, as demonstrated explicitly and formally by the Fundamental Theorem of Calculus which states essentially that if one function is defined as the integral of another *continuous* function, then *differentiating* the new function returns the function you started with.

It is fascinating to note that this polarity of "derivative and integral" also goes by the name of "differentiation and integration," respectively. And, as we have seen, differentiation and integration are fundamental to the embryogenesis of the concept. In this case, "differentiation and integration" are not only *implicit* in the embryogenesis of the operational concept of the calculus, but *explicitly* transcended-and-included in its genetic and operational make-up, and hence included as well in the formal operationalization of mathematical rationalism into the body of mathematics proper. The raw utility of the calculus, with its polarity of core operations, is therefore an example of the utility of the differentiate-and-integrate polarity of the embryogenesis of the concept itself.

The "Ghost of Departed Quantities" and the Problem with the Infinitesimal

So far this all sounds well and good. Indeed it *is* very well and good, as far as the *mathematics* of calculus is concerned. The calculus is an extremely powerful mathematical tool, and it is used routinely and critically in virtually all scientific and technological fields, from economics to rocket science. And hence it is even perhaps justifiable (at least pragmatically so) that

mathematicians would perhaps write-off and ignore the complaints of philosophers ever since the inception of the calculus, about problems with its *meaning*, especially where the infinitesimal is concerned. Despite these problems, the extreme utility of the calculus indicates that there is a deep truth embodied in its operations. And it is the job of philosophy, or meta-mathematics, to create, discover and integrate that truth into the collective body of understanding.

The philosophical problems with the calculus stretch all the way back to its inception and to the concept of the infinitesimal at its core. At the heart of the calculus is the mathematical ratio taken to its unreachable "limit" in the unlimited, at the rational zero, or the immanent pole of the Immanent/Transcendent axis (often offset to the immanence between higher level intervals or numbers, as we have seen). As we have discussed, both processes, the derivative and integral, deal directly with the infinitesimal. But many philosophers after its inception criticized the calculus for being based on fuzzy ideas and non-rigorous foundations. George Berkeley, for example, talked of the infinitesimal as "the ghost of departed quantities." Those fuzzy ideas, as we have seen throughout this work, remain at the heart of modern mathematics with its prematurely aborted rationalism and pre-differentiated, or intrinsic and unacknowledged, immanent-transcendent axis manifesting as such things as the 'undefined' infinity of division by zero (the rational zero) and even Zeno's paradoxes of the infinite. It is this same "undefined" pre-rational fuzziness that leads to the philosophical problems with the calculus addressed in this section.

In his paper, "Philosophical Problems with Calculus," Kelley L. Ross demonstrates that in the traditional method of taking a derivative—which involves this infinite division inherent in the calculus— *dy/dx* would *ultimately* represent *zero/zero*, as the difference, *d*, *reached* the unreachable (infinite) rational zero. And *zero/zero*, Ross states "is ordinarily a useless or meaningless relationship in mathematics: zero divided by anything is zero; and anything divided by zero is often said to be 'undefined,' which is a polite (or wimpy) way of saying 'infinite.'" Newton and Leibniz, *according to Ross*, explain this away by saying that *dy/dx* were not *really* zero, but the quantity they have *just before they reach zero.* "But, it is objected, there is no quantity 'just before' zero. Either there is a finite number ... or there is zero, in which case *dy/dx* is either meaningless or indeterminate.'"

The philosophical problem with this definition of the infinitesimal is obvious in light of the Vision-Logic Coordinate System and the newly operationalized Immanent/Transcendent axis intrinsic to rationality itself. There is no "right before reaching," for *any* infinity—transitive, transcendent

or immanent.[i] Infinity is not a boundary or a limit and *cannot be reached*. This is the limit of the limitless. The use of infinitesimals helped to hide the immanent infinity threatened to be exposed by the rational zero, and as such infinitesimals were considered quantities *greater than* zero—otherwise the calculations end up at infinity in division by zero—but smaller than any possible or conceivable number. They are the inexpressible-but-finite numbers right before "reaching" the unreachable[ii] immanent infinity of the rational zero. This, in effect, is the pushing of the finite far enough into the infinite immanence that we merely *lose sight of it*, at which point we can safely and, from an operational standpoint, inconsequentially pretend that it is infinite (in the immanent direction), which is zero. This fuzzy and subtle oxymoron is Berkeley's "ghost of departed quantities." The limit here is one of conceptual horizons: out of sight, out of mind. The quantity is *effectively* zero, but not quite, because that would lead to undefinables in the pre-rational, transitive Cartesian system.

But a fully integrated, and integral—and indeed post-Cartesian—rationality, such as Nondual Rationalism, must acknowledge the positive and uncountable infinity of immanence unfolding with the advent of rationality and operationalize it into an Immanent/Transcendent axis and polarity. Only then will the problem of the infinitesimal be resolved, as we will see.

Fixing "The Limit" of the Unlimited

To avoid these conceptual and philosophical problems (rather than solve them), mathematicians invented the more abstract and distant notion of the "limit." This operational concept essentially allows them to ignore the infinitesimal at the heart of the calculus and leap right over the infinite abyss of regressive immanence to the external boundary on the number-line which it *unendingly* "approaches." As John Stillwell notes in his *Yearning for the Impossible, The Surprising Truths of Mathematics*,[iii ¥] "the mainstream approach to calculus used today...denies the existence of infinitesimals, and interprets the word 'infinitesimal' as a mere figure of speech in statements that are properly made using limits." Stillwell goes on to show, that the avoidance of infinitesimals, due to their philosophical problems, comes "at the cost of a strange dual notation: Δ for actual differences and *d* (the ghost of Leibniz!) for the limits of their quotients and sums." This is a cumbersome and *ad hoc* inconvenience which many mathematicians would

[i] This is the classic case of the transcendent-bias because it is much more common to make this mistake of bounding the unbounded in the immanent than in the transcendent direction; a mathematical instantiation of foundationalism from the lofty perch of transcendent operations.

[ii] … note the constant refrain of this oxymoron…

[iii¥] John Stillwell *Yearning for the Impossible, The Surprising Truths of Mathematics* A.K. Peter, Ltd., Wellesley, Massachusetts, 2006], pp.99-100, qtd. in Ross

like to get rid of. As Stillwell puts it, "To many this is a compromise solution which fails to explain why infinitesimals work."

The problems with the infinitesimal, then, are not *just* philosophical anymore, but mathematical, because mathematicians are influenced, and rightly so, by the clamoring voices of philosophers. In order to temporarily quiet the mathematical philosophers, the cumbersome dual notation was invented to distance the calculus from the problematic infinitesimal hidden within its form and history.

But Stillwell goes on to ask, "Is it possible to define and use genuine infinitesimals?" There have been mathematical attempts, he shows, such as Abraham Robinson's *nonstandard analysis*, but none of them are "as simple as the old Leibniz calculus of infinitesimals, and there is a continuing search for a really natural system that uses infinitesimals in a consistent way."

Given that philosophy is where the problems of the calculus began, then the solution to the problem must also be largely *philosophical*. Recall that the problematic definition given by Newton and Leibniz, according to academia, is that the infinitesimal is not *really* zero, but the quantity *just before it reaches zero.* And recall that it is objected that "there is no quantity 'just before' zero," since we are dealing with an infinite axis. "Either there is a finite number ... or there is zero, in which case *dy/dx* is either meaningless or indeterminate.'" Again, this is the vague and fuzzy "ghost of departed quantities" criticism by the philosopher George Berkeley, et al, and it indeed changed the course of the calculus, and arguably (if temporarily) for the worse.

So how can we use Interface Mathematics and Nondual Rationalism to give a coherent operational context and definition of the infinitesimal so that its use could be acknowledged and reinstated to make life easy again for the mathematician? The essentials of the answer should already be apparent to most, but we'll dive in deep and flesh it out in detail.

The Hidden Leibnizian Thread

The understanding of infinitesimals is natural to Nondual Rationalism for many reasons. I'll extract three of them here. First of all, infinitesimals represent immanent values only attainable with the mathematical ratio and the dissolution of the integer-quantizing closure property in the higher function of Rational numbers (which occurs mainly through the inversion of the input/output polarity, as we have seen).[i]* It is therefore only fitting that in the age of "rationalism" a method was finally invented for dealing with these rational qualities and quantities which have puzzled mathematicians

[i]* See, The Holarchical Unfolding of Number and Operation, p306.

and philosophers since antiquity resulting in such vexing problems as Zeno's paradox, and the "undefinition" of division by zero. Secondly, the deep or positive infinity and immanence opened up by the Rational numbers is embodied in the fundamental Principle of Nondual Rationalism and the newly operational Immanent/Transcendent axis. And third, the immanent zero, *forever approached*, *but never reached* by the infinitesimal, is the mathematical embodiment of Nagarjuna's Emptiness or *sunyata*, as we have seen, as well as the essence of yin, the feminine, dark and mysterious principle from which transcendent forms emerge.

The solution to the problem of the infinitesimal has therefore been with us implicitly in the East since at least the 2nd century, and it is inherent in the explication and operationalization of the Immanent/Transcendent axis already implicit in the nascent project of Western mathematical and philosophical Rationalism, such as in core polarity hidden in Zeno's paradoxes: and more specifically, in the esoteric understanding of the Triune Infinite of Spinoza and the mature (*informed* by the Triune Infinite) Leibnizian monadology, as we will see.

As Kelley L. Ross states in his *Gottfried Wilhelm Leibniz*, "Calculus in the 17th century was thought to deal with infinitesimal, or almost infinitely small, quantities. Leibniz, as it happens, has very conveniently provided a metaphysics to match this. No matter how small the quantity, there is a monad there."[i¥] Indeed, the infinitesimal (rationally understood) is merely a monad beyond, or beneath, the immanent horizon of the indefinite mathematical imagination.[ii] And further, Leibniz ultimately saw the infinitesimal—an "infinitely small" point represented *mathematically* as zero—as a ***necessary fiction*** to operationally bridge the infinite gap of the series, only "convergent" from a transitive frame of reference on the infinity of the immanent/rational zero.

In *Leibniz on Mathematics and the Actually Infinite Division of Matter*,[iii¥] Samuel Levey explains (my **emphases**),

> Though Leibniz is on occasion prepared to talk of the infinitesimal as "an infinitely small fraction or one whose denominator is an infinite number" (GM 4:93), this is not his most considered account of the concept. The most considered account, rather, is expressed when he writes of the infinitesimal as an "incomparable magnitude," a phrase he clarifies thus: "these incomparable magnitudes . . . are not at all fixed or determined but

[i¥] (http://www.friesian.com/leibniz.htm)

[ii] This intrinsically volumetric aspect is also key to the definition of a point in Buckminster Fuller's Synergetic Geometry and it corresponds to Gerald Lebau's "needle sharp point," as we have seen.

[iii¥] The Philosophical Review, Vol. 107, No. 1 (Jan., 1998), 49-96.

> can be taken ***as small as we wish*** in our geometrical reasoning and so have ***the effect of the infinitely small*** in the rigorous sense."[i¥]

Levey goes on:

> ...it is perfectly clear that by the spring of 1676 Leibniz takes the infinitesimals of his mathematics to be ***"fictions."*** And in writings of many years later, he occasionally suggests that he has a positive argument ***against the very possibility of infinitesimal quantities***.[ii¥]

So we can see here that Leibniz's most considered and esoteric view is quite a bit different from the problematic view of the infinitesimal attributed to him in exoteric or common accounts of History, including that of Hegel, as we will see. The infinitesimal, for Leibniz, was not "the quantity [of infinite division] *just before it reaches zero*," but rather a *necessary fiction* for dealing with infinite division (immanence) from the default (transitive) frame of reference (transcended-and-included in the holarchical embryogenesis) of mathematics. For Leibniz, the "*just before it reaches zero*" was itself a perspectival illusion, a necessary fiction to "escape the infinite regress" of immanence seen from the transcendent perch of the transitive.

This lesser known and more mature Leibnizian view, as we will see, is essentially what Deleuze calls the "differential point of view of the infinitesimal calculus," and it is a critical Leibnizian link in Deleuze's alternate lineage of the history of mathematics and philosophy, as opposed to Hegel's transcend-and-negate dialectical misrepresentation of both Spinoza and Leibniz.

The Spinozan Catalyst in the Triune Infinite

Levey goes on to show, however, (which we will see echoed in Deleuze below) that Leibniz's change in thought regarding the infinitesimal is concurrent with his 1676 studies of Spinoza, and specifically his reading of Spinoza's famous *Letter XII* on the infinite (which, recall, Leibniz acquired *secretly* in order to maintain his *public* anti-Spinozistic stance). This letter, as we have seen, contains Spinoza's most explicit account of his Triune Infinite which, along with univocity, is found *implicitly* throughout his *Ethics*, as an "organizing principle."

Levey says:

> In his later analysis of the continuum, Leibniz contends that the labyrinth arises from confusing the character of matter [namely infinite divisibility] with that of mathematical or geometrical continua: either supposing

[i¥] Letter to Varignon, 1702. GM 4:91

[ii¥] "GM 3:524, 551"

> matter to be continuous or supposing continua to be composites of discrete parts (G 2:282).
>
> … Or, to capture the contrast with "actual parts": the parts of an ideal whole are merely possible or potential [*a posteriori*] parts. And crucially, it is "because the part is only possible and ideal" that the whole is prior to the part in the continuum (G 4:491f.).

Note the connection with the aspect infinite as an abstraction *from* The Infinite. The whole of The Infinite is logically prior to its abstracted aspects, such as an immanent local aspect of an extensionless point [my ***emphasis***].

> … To see this still more clearly, take this example. "Whenever someone has conceived duration abstractly, and by confusing it with time has begun to divide it into parts, he will never be able to understand how an hour, for example, can pass. For in order for the hour to pass, it will be necessary for half of it to pass first, and then half of the remainder, and then half of what remains of this remainder. And if he subtracts half from the remainder in this way indefinitely, he will never be able to reach the end of the hour.[i] Hence many people who have not been in the habit of distinguishing *entia rationis* from real things, have dared to declare that duration is composed of moments. In their desire to avoid Charybdis, they have run into Scylla." (A 6.3:279)
>
> Confusion between "entities of reason" and "real things" leads one to posit discrete parts (such as moments) in what are in fact continuous wholes (such as duration "conceived abstractly"), and quickly embroils one in the classical paradoxes of the continuum. One especially remarkable feature of this early anticipation of Leibniz's later analysis of the source of the labyrinth is that the author of the passage just quoted is Spinoza. Leibniz here is simply recopying an excerpt of the so-called *Letter XII*, On the nature of the Infinite, of 1663 … ***but the uncanny resemblance between the excerpt's apparent import and aspects of Leibniz's own later views strongly suggests that those aspects originate in Leibniz's 1676 Spinoza studies***.

Prior to this encounter with Spinoza's triune model of infinity, Leibniz had been entertaining the inherited Euclidean notion that the continuum must be constructed of elements, i.e. from an "infinite number" of "infinitely small," points. But after his 1676 Spinoza studies, Leibniz changed his stance (pre-echoing Fuller's own childhood realization of modelability leading to his Synergetic Geometry), saying now that this construction of an *actual* continuum from the "infinitely small," is impossible, and that a mathematical point (or an infinitesimal quantity) is merely an abstract "terminus" in the pre-existing, but still abstract, continuum.

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[i] This, of course, is a temporal version of Zeno's paradox, who's solution also follows from a solution to the labyrinth of the continuum, and the infinitesimal, which Leibniz found through Spinoza's Triune Infinite. See, Back to Zeno, p448.

We know this abstract "terminus" (that never terminates) herein—from our own studies of Spinoza's Triune Infinite—as the immanent or positional (immanent-uni-local) ***aspect*** of The Infinite, or operationally as the immanent pole of the immanent/transcendent *uni*-axis. And we know the continuum itself as the omni-non-local and uncountable ***aspect*** of immanence, and operationally as the immanent pole of the immanent/transcendent *omni*-axis [i]*—the ONE as the ALL of infinite multiplicity. Both of these VL-axes fall under Spinoza's Triune Infinite as 2nd order, or Aspect infinities, as we have seen.

The infinite convergent series "converges" towards its bound, but on the Immanent/Transcendent axis it never actually gets any closer because the bound is just outside (or transitive to) the (immanent) series. This convergence only *seems* to get closer from a particular stationary point of view, and most importantly, relative to a *reference point/frame* on the transitive number-line or grid. Since, as Leibniz shows later on, the series can have no final term or cardinal, it is always infinitely far away. Implicitly obvious, yet unacknowledged and unoperationalized in standard mathematics, convergent series are operating not merely on the transitive axis where its "bounds" or limits are located and enacted, but on the Immanent/Transcendent axis.

And here we can see that the *con-fusion* surrounding the infinitesimal (even as it pre-echoes in Zeno's paradoxes)[ii]* is caused by a *conflation of the pre-fused distinction* between the immanent/transcendent and transitive VL-axes—a distinction which only becomes fully differentiated when the project of rationalism comes to fruition.

Leibnizian Pre-Echoes of Cantor

Levey goes on to demonstrate that the Leibnizian "point of view of the infinitesimal calculus" allowed Leibniz to anticipate some of the revolutionary insights of modern set theory which arose in the context of an uncompleted philosophical and mathematical rationality, and hence emerged into a confused meta-mathematical space of interpretation—thus ultimately failing to take root. Unfortunately we won't have time to explore this fascinating thread further in this volume. For now we'll simply explore the Leibnizian anticipation and the Spinozan/Leibnizian keys to the Deleuzian alternative lineage of History, centered on the calculus and the positive infinity or immanence of the rational.

[i]* See, I/T Omni- and Uni-axes, p145.

[ii]* See, Back to Zeno, p448.

The cardinality of a set is determined by the number of terms within it. In mathematics, the "naïve principle" states that in an "infinite set" this cardinal would correspond to the "final" ordinal within it; the "infinitieth" term, or the "number infinity." But through his analysis of the infinite convergent series, catalyzed by his 1676 Spinoza studies, Leibniz comes to reject the applicability of this principle to an infinite set, because infinity can have no final "infinitieth" term.

This "singling out and rejecting" of the naïve principle, "a mathematical principle that runs deep in early modern thought," Levey states "in effect anticipates some of the revolutionary insights that will, two hundred years later, spark the most profound developments in mathematics...." This indeed, was one of Cantor's great insights in his revolutionary, yet systematically misunderstood, Set Theory with its controversial definitions and transfinite orders of "infinite sets."

Levey explains:

> I have argued that Leibniz's actual mathematics for calculating the sums of infinite series encodes a certain conception of the infinite convergent series, what I call "the mathematical conception," according to which there is a terminal element bounding the series at its diminishing end. That terminal element is supposed to be the infinitieth term in the series, and is itself an infinitesimal magnitude. We knew already that Leibniz denies the existence of infinitesimals. We now see also that he denies the existence of an infinite number. But the mathematical conception evidently implies the existence of both. Thus, we see more than just a puzzle about how to make sense of his views of the composition of matter: Leibniz's philosophical views about mathematics—his denials of infinite and infinitesimal numbers—appear to be in conflict with the commitments of his own mathematical practices. Something has to give if coherence is to be maintained. In "Infinite Numbers," a cluster of notes dated to 10 April 1676, Leibniz confronts these difficulties and submits the concept of the infinite convergent series and its use in mathematics to close scrutiny. From this renewed inquiry into mathematics emerges a stable and subtle philosophy of mathematics and philosophy of the infinite, and in the process the passage to the later period of his 1676 mathematics is transacted.
>
> In *De Quadratura Arithmetica* (1676) Leibniz says expressly that we engage in a certain "fiction" when, in order to find the value of an infinite quantity, we suppose that it is bounded (133), as in the example of the last passage "something must be added" to the infinite series in order to calculate its sum. That "something" does not in fact occur in the series. The mathematical conception of the infinite series smuggles in a fictional terminus under its interpretation of the rider 'etc.' or 'to infinity' that is inevitably affixed to the expression of the series as "measured" or as having a sum. Since that series does not in fact contain a last term, the proposition involving its measured form engages directly (if tacitly) in a fiction, and so must be said not to be rigorously true. ... Talk of the sum of

an infinite series is thus cashed in for rigorously true generalized talk of the sums of finite series and of the rules for producing them.

Leibniz says, "Whenever it is said that a certain infinite series of numbers has a sum, I am of the opinion that all that is being said is that any finite series with the same rule has a sum, and that the error always diminishes as the series increases, so that it becomes as small as we would like."[i¥]

Levey continues [[my comments]]:

Once the mathematical conception of the infinite series is replaced with the **operationalist** one, it becomes possible for all those philosophically undesirable commitments to be severed from his mathematics.

…Thus, Leibniz's philosophy of the infinite, places the concept of infinity safely outside the scope of the concept of number. The infinite can exist in the realm of mathematics, but not as a single whole; rather, the infinite provides the framework for mathematics, so to speak, appearing only as the infinity of mathematical objects but never occurring within mathematics as a unitary, infinite mathematical object. Likewise for the world of matter: there can be an actual infinity of matter's parts, but, perhaps ironically, those "parts" can never constitute a true whole [[…because it is the whole from which the parts are abstracted aspects]].

…The mathematical conception of the infinite series has been dispatched, along with its cadre of problematic notions: the "bounded infinite,"[ii] the infinitesimal, the infinite cardinal, and the infinite series itself, if taken as a genuine whole. All are excised from the rigorously correct understanding of mathematics, and are retained only in their appearances, as facets of a practically useful technique towards which an operationalist[iii] stance is to be assumed. Having cut the infinite series free from its imagined undesirable consequences, Leibniz can at last secure the concept of the infinite convergent numerical series, an unbounded infinite series consisting entirely of finite terms that can be said to have a finite sum. And this brings us back to his inquiry into the metaphysics of matter, for the very point in clarifying and securing that concept of the infinite series has been to isolate an abstract structure that could serve as a coherent model for his account of the infinite division of matter. ***As a consequence of its circulating through irregular spaces in a plenum, a portion of matter would have to be divided into an actual infinity of parts***. But these parts could not be "metaphysical points" or minima, since, as the analysis of the continuum revealed, minima can only be termini [[abstracted locations or immanent aspects of The Infinite, or "folds," as Deleuze would call them]] and never parts of things. Nor is it correct to suppose that those parts are actual infinitesimals. Rather, it must somehow be possible for a finite portion of matter to be divided into an infinity of parts, each of which is divisible and of some finite size. The

[i¥] A 6.3:503

[ii] Note that this is not the same Bounded or Modal Infinite from Spinoza's Triune Infinite.

[iii] This is not to be confused with Fuller's Operational Mathematics.

> infinite convergent numerical series makes its metaphysical contribution here by providing precisely such a possibility. A finite portion of matter might divide into an infinity of finite and divisible parts just as a finite number might divide into an infinity of finite and divisible numbers. The moving portion of matter, as it adjusts its shape, divides into an infinity of smaller parts, each of which is surpassed in smallness by some other part but none of which is indivisible or infinitesimal. Again, Zeno's series makes for a nice example:

After his 1676 Spinoza studies, Leibniz's mathematics of the infinitesimal is now in perfect coevolutionary conjunction with his mathematics of the infinite, as well as his metaphysics of mind and matter. As Levey shows, Leibniz's most considered conception of the composition of matter was essentially the same as the Deleuzian "differential point of view of the infinitesimal calculus." Originally, for Leibniz, matter (just as the continuum) was infinitely divided into *extensionless points*. But through his rejection of the "naive principle" of an infinite set (as applied to the immanent infinity of rationality and the calculus), he comes to the conclusion that, while matter *is* infinitely divided, it is not divided into extensionless points, but each time into finite or bounded ones. Each new division (a monad) is finite or non-zero in size and thus further divisible into 'infinitely many' more such points *never converging on an extensionless, indivisible point to be added up to any cardinality*. Just as in our fundamental principle of Nondual Rationalism, *infinite* divisibility is *endless* divisibility, or *in*divisibility. It never reaches an end. The ends reached are always the result of finite divisibility and they end in finite divisions or boundaries, never infinitely small points.

Naturally, this puts us, both ontologically and mathematically, right in the middle of an infinite endless holarchy of nested units, or holons, exactly as postulated in Self-similar Cosmology, Ken Wilber's Integral Methodological Pluralism, and the physical model of SpinbitZ which we will explore in *Volume II* of this series.

THE NONDUAL-RATIONAL INTERFACE SOLUTION

As we have seen, the extensionless point—in the context of division and the ratio—is the rational or immanent zero; the immanent pole of the immanent/transcendent uni-axis. As such, it can't be "reached" or bounded by any number or division. The infinitesimal, in other words—conceived of as "the number right before reaching zero," or an "infinitely small" number—*cannot* exist. It can only be a convenient fiction. In Spinoza's Triune Infinite, as we have seen, the "point" is seen simply as the immanent-local *aspect* of The Infinite;[i] an immanent infinity.

The "limit" in calculus—replacing the problematic "ghost of departed quantities" (the infinitesimal)—therefore must be seen purely in the function of operationalizing—i.e. finitizing, bounding or reaching—the new immanent uncountable infinity of the I/T axis, broken open through the immanent operations of the ratio and the root functions (as we have seen). It must be seen simply as a tool or trick for integrating the new I/T axis *into* the trans-biased bounding or numerating operations of pre-rational mathematics transcended-and-included at the trans-rational level of the calculus.

The limit is the "finitizing" leap across the infinite immanent/regressive abyss in order to bring the infinite and uncountable I/T sum to a finite and countable transitive end. This operational leap is philosophically warranted herein because the immanent/transcendent is a polarity, and, by the identity of opposites, every regressive immanent value is also progressively transcendent from deeper values and possible frames of reference, and vice versa. Indeed, the aperspectival nature of the Vision-Logic Coordinate System requires us to take on these immanent perspectives so that we can see the transcendent value in any immanent infinitesimal, a non-zero value only *appearing* from above as equivalent to the transitive zero of negation or the implicit singularity of the immanent zero.

An essential thread of Nondual Rationalism is the overcoming of the transcendent-bias by the integrating of the immanent, the positive and progressive or emergent infinity as the secret of the rational. This is the identity of opposites, of transcendence in immanence (yang in yin in yang …), embodied and operationalized in the Immanent/Transcendent axis, and

[i] And the immanent-omni-non-local aspect of The Infinite is, of course, the immanent pole of the immanent/transcendent *omni*-axis.

the Principle of Immanence in Transcendence, the 2nd chord in our Ariadne's cable out of the labyrinth of the continuum.

The infinitesimal, then, is the essentially-arbitrary (or perspectival), and *effectively*-null transitive value required to operationally recognize or map the transcendent value in the immanence of the limit, allowing the regressive "abyss" to be a progressive or positive axis, ultimately ending in integrating the immanent uncountable pole into the fundamentally transitive and countable operations transcended-and-included in rationality and the calculus.

Or to put it simply—and to return partially to Leibniz's own general-level answer—the infinitesimal is a necessary fiction, an ***effective*** or ***approximate*** zero, needed to operationally bridge the infinite gap of immanence opened up by the mathematical ratio, and to integrate the newly discovered Immanent/Transcendent axis of rationality into the default (trans-bias) transitive frame of reference of the pre-rational Cartesian axes.

The question then arises, "If the solution to the problem of the calculus was ultimately so simple (rather obvious), and already implicit in the Leibnizian metaphysics, then why was there ever a problem in the first place?"

We have already seen the Leibnizian, philosophical fix to the problem of the calculus, but without a sociological fix as well, a philosophical solution is isolated to the individual who invented it. Though Leibniz, in his more mature reflections, had recognized the impossibility of the infinitesimal, he failed not only to explicitly recognize[i] *but to operationalize* the new VL-axis upon which mathematical rationalism was operating. To take hold, the Leibnizian fix requires the explicit, esoteric, or common-place societal acknowledgment and operationalization of the move, in rationalism and the calculus, to this new Immanent/Transcendent axis. This explicit operationalization would manifest in, among other things, putting the obvious definition of infinity explicitly into the "undefined" rational zero.

Leibniz did not accomplish this step. He did not make explicit, for all to explore, the existence of this implicit rational VL-axis and the nature of its holarchical, embryological relation to the body of mathematics as a whole, so his most considered metaphysical insights, about the *rational* way to *understand* the calculus, did not take root and flourish in the mathematical and meta-mathematical minds of his contemporaries.

The project of rationalism was still-born, aborted—its developmental trajectory derailed—due largely to the incompleteness of its operational VL-axis, but also because of the difficulty of accepting its more esoteric truths caustic to the pre-rational and mythical-categorical level of development of

[i] … along with its embryogenesis of the concept, holarchical structure, origin-identities and offsets, etc.

the power structures in the "enlightenment era" and beyond. This incomplete rationality allowed the reassertion of reactionary pre-rational tendencies, the transcendent-biased forces of representation inherent in the socio-economic LCD basis of post-medieval reality. This pendulum swing back to the pre-rational, as Mathew Stewart demonstrates in *The Courtier and the Heretic*, was even given misdirected force in the explosive reaction (and transcendent-/representational-bias) inherent in Leibniz's own Theistic and Idealistic philosophy, against his own inherent Spinozism, covert-rationalism and modernism.

Thus rationality has languished through misrepresentation after misrepresentation, lying dormant, until this torturously extended moment when Spinoza—dubbed "the prince of philosophers" by Deleuze—is experiencing a rebirth and radical explosion in scholarship. The tracks of Rationalism are being reassembled, based on electro-magnetic, nondual levitation this time, and the train is ready to bullet from the station.

RECONNECTING TO THE DELEUZIAN ALTERNATIVE LINEAGE

Hegel's Calculus of Misrepresentation

In Spinoza's famous *Letter XII* on the infinite we are presented with a "geometrical example" that uses two non-concentric circles to demonstrate the 3rd order, modal or bounded infinite (See Figure 59, below). Spinoza says:

> As, for instance, in the case of two circles, non-concentric, whereof one encloses the other, no number can express the inequalities of distance which exist between the two circles... This conclusion is not based on the excessive size of the intervening space. However small a portion of it we take, the inequalities of this small portion will surpass all numerical expression. Nor, again, is the conclusion based on the fact, as in other cases, that we do not know the maximum and the minimum of the said space. It springs simply from the fact, that the nature of the space between two non-concentric circles cannot be expressed in number. Therefore, he who would assign a numerical equivalent for the inequalities in question, would be bound, at the same time, to bring about that a circle should not be a circle.

In *The Science of Logic*,[i¥] Hegel claims that this example demonstrates the absence of the differential of the calculus in Spinoza's thought. This interpretation of Spinoza as having missed the essence of the calculus—as opposed to Newton, for example, who "invented" the calculus and who, according to Hegel, was the one progenitor who properly understood it—presents Hegel with further opportunity to dismiss Spinoza (and in turn Leibniz) and as a hapless historical victim of his dialectical progression toward the apex of philosophical perfection and the completion of History in Hegel's own "absolute idealism."

[i¥] p251

The first opportunity to dismiss Spinoza in the *Science of Logic* was with Hegel's earlier claim that "with Spinoza, substance and its absolute unity has the form of an inert unity, i.e. of a unity which is not self-mediated, of a fixity or rigidity in which the Notion of the negative unity of the self, i.e. subjectivity, is still lacking."[i¥] Hegel has here neglected and/or misunderstood the middle-path third of Spinoza's attribute polarity; his symbiogenesis and dependent arising of subject and object. But at a deeper level, Hegel has transposed Spinoza's ineffable absolute into the relative scope, his boundless Emptiness into a bounded object and his Substance into a "rigid" modification. All of this to allow for a spurious, transcend-and-negate dialectical critique, based on a lack of opposites for the opposite of opposites, the absolute scope.

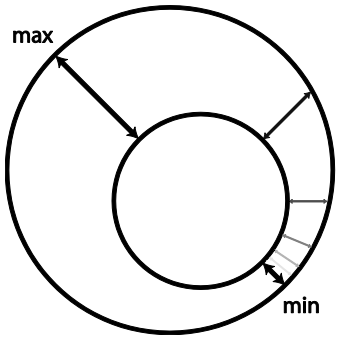

Figure 59: Spinoza's Geometrical Example of the Bounded Infinite: A representation of Spinoza's geometrical example illustrating the shrinking into immanence necessary to realize the innumerable differences in distance between the two non-concentric circles.

Spinoza's univocal Substance, as absolute scope, is ineffable; polar terminals are inapplicable to it. Rigidity, flexibility, passivity, activity—the properties of the relative scope; of time and space—do not apply. In this sense, Substance is both and neither active and passive, subjective and objective, etc and non-etc. Spinoza says essentially this in his pre-*Ethics* work the *Short Treatise* as we have seen in the Univocity Framework.

In a similar way, as we will see, Hegel transposes the immanence in Spinoza's *Letter XII* example into transitivity—itself present only because transitivity is transcended-and-included in the higher power relations of the Rational numbers, acting upon the new Immanent/Transcendent axis. And hence this transitivity is present in Spinoza's illustration as he integrates the new immanent infinity of the modal or bounded infinite into the transcended-and-included pre-rational transitive-axis of the Cartesian number-system. In true Hegelian fashion this conveniently allows for a spurious, transcend-and-negate critique further securing Hegel's representation of his absolute idealism at the apex of History.

[i¥] Science of Logic § 565

In a remark in his *Science of Logic*, Hegel says (my ***emphasis***):

> The mathematical example with which he [Spinoza] illustrates ***the true infinite*** is a space between two unequal circles which are not concentric, one of which lies inside the other without touching it.[i¥]

This example does not purport to show "the" true infinite, but merely an aspect of uncountable immanence manifesting in the bounded and *lowest* order of the infinite, "…that, of which the parts cannot be equaled or expressed by any number, though the greatest and least magnitude of the whole may be known..." (*Letter XII*) The maximum and minimum distance between the circles may be known, but no number can express in total the differences in distance between them.

Hegel continues:

> It seems that he thought highly of this figure and of the concept which it was used to illustrate, making it the motto of his *Ethics.*

Spinoza's *Ethics* deals with the interface between The Infinite and finite, e.g. between "God" and man, so this is a natural observation, and no doubt a main reason Deleuze bases his own interpretation of the *Ethics* on this same example.

> 'Mathematicians conclude', he says, 'that the inequalities possible in such a space are infinite, not from the infinite *amount* of parts, for its size is *fixed and limited and* can assume larger and smaller such spaces, but because the nature of the fact surpasses every determinateness.' It is evident that Spinoza rejects that conception of the infinite which represents it as an amount or as a series which is not completed, and he points out that here, in the space of his example, the infinite is not beyond, but actually present and complete;

This complete infinity is the positive infinity of rationality; the uncountable immanence opened up with the "violation" of the closure property of the integers in the countable infinity of the Rational numbers, and the same immanence explored and operationalized in the calculus. It is indeed "not beyond," not transcendent to, "but actually present and [*a priori*] complete," *within*, immanent to, the boundary of the finite, in which it shares a polar relationship. That is precisely the point of this example of the bounded infinite.

> …this space is bounded, but it is infinite 'because the nature of the fact surpasses every determinateness', because the determination of magnitude contained in it cannot at the same time be represented as a quantum [[a number or boundary]], or in Kant's words already quoted, the *synthesis* cannot be completed to form a (discrete) quantum.

[i¥] *Science of Logic* § 566

In other words, "no number can express" it, as Spinoza so carefully states. Hegel continues (my ***emphasis***):

> The incommensurability which lies in Spinoza's example ***embraces*** in general the functions of curved lines and more precisely, leads to the infinite which mathematics has introduced with such functions, in general, with the ***functions of variable magnitudes***.[i¥]

Yes, the curved functions are embraced in this example, but the infinite space illustrated here is that immanence opened up not merely by functions of *variable* magnitude. These curves, as we have seen, can be either transitive, transcendent or immanent, and they could also be based on *variable* integers. But Spinoza's example *specifically* illustrates the relation between two 2nd degree *continuous* functions, emphasizing, even more specifically, the *immanence* opened up in the pulverization of numerical identity in the mathematical ratio (such as *dy/dx*), and operationalized by the Immanent/Transcendent axis. It is this relation of powers in the mathematical ratio, transcended, included, and fully operationalized in the power/root functions, that allows for the variable *continuity* at the foundations of the calculus, and critically encoded in its fundamental theorem. The transitive axis of the variable integer, or dis-continuous functions is included, but radically transcended in the operations of the Rational numbers. So without recognizing the prefused distinction between the immanent/transcendent and transitive, this conflation and con-fusion is understandable.

> This infinite is the *genuine mathematical* qualitative infinite which Spinoza also had in mind...

This infinite is the bounded 3rd order infinite; ***merely one type*** of "qualitative infinite which Spinoza also had in mind," but it is centered on the new axis of immanence opened up to operationality by the ratio, and represents the full-circle return of the finite to its source, in The Cycle of Unity and origin-identities (as we have seen).

Curiously, Hegel goes on to say:

> The expression 'variable magnitudes' is therefore very vague and ill-chosen for those determinations of magnitude whose interest and manner of treatment lie in something quite distinct from their mere variability.[ii¥]

Yes, and ve vonder who chose it! Not even the term 'variable' appears in Spinoza's text, and indeed we are dealing with "something quite distinct

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[i¥] § 567

[ii¥] § 568

from ... mere variability" and mere curved functions, in Spinoza's example. Maybe what follows can explain it.

> ...It is, too, only because of a lack of awareness of what constitutes the peculiar interest of higher analysis and of what has led to the need for and invention of the differential calculus, that functions of the first degree and the equation of the straight line are themselves included in the treatment of this calculus; [i¥]

These lower degree transitive functions are, of course, transcended-and-included in the functions of the calculus. However, Spinoza's example does not explicitly use the straight line, but points to the *difference between two circles*, each of which is a *2nd degree* function, and the infinity in question depends critically on this factor. In other words, there are several transcended-and-included layers of "relations of power" in Spinoza's example; the relation of transitive magnitudes transcended-and-included in the ratios making possible the continuity of the curves, the relations of ratios in the 2nd degree functions of the circles, and the relation of offset between the infinitely continuous circles themselves, illustrating an infinite and uncountable depth of difference in the distance between them.

> ...such formalism originates partly, too, in the mistake of imagining that the intrinsically correct demand for the *generalisation* of a method has been fulfilled when the *specific* determinateness on which the need for the calculus is based is omitted, as if in this domain we were concerned only with *variable magnitudes.* A great deal of formalism would, indeed, have been avoided if it had been perceived that the calculus is concerned not with variable magnitudes as such but with *relations of powers.*

Hegel rightly claims (conveniently opposing his personal Spinoza) that "the calculus is concerned not with variable magnitudes...but with relations of powers." This leaves the erroneous interpretation of calculus—as leading merely to (or from) the infinite of "variable magnitudes"—falsely projected onto Spinoza's example, and it leaves unacknowledged the uncountable immanence in this example, in the Triune Infinite in general, in Spinoza's *Letter XII,* and indeed pervading his *Ethics.*

This is where Hegel's interpretive error lies. He erroneously claims that Spinoza's example is not concerned with "*relations of powers,*" but leads merely to or from the infinite of the variable function. Indeed, what is the mathematical ratio if not a relation of powers? And, as we have seen, it is this relation that breaks open the immanence in Spinoza's geometrical example, regardless of the degree of those powers. Without the relations of magnitudes in the mathematical ratio, there *could be* no continuously varying functions, no continuous higher power functions, no infinitesimal, no limit and no calculus.

[i¥] § 569

This error is the Hegelian transcend-and-negate transposition of the immanence and continuity of rationality and the uncountable infinity of the bounded infinite in Spinoza's geometrical example, into the mere transitivity of variable functions. But we have seen that the immanence and continuity of rationality is the key to the calculus, and indeed, it is the same infinity upon which the power functions operate, as well as the "acategorical imperative" of Nagarjunan/Deleuzian/Spinozan Emptiness.

It is immanence, and the positive infinity of rationality, as it manifests from the immanent/transcendent omni-axis of uncountable continuity, that is the essence of the calculus, and this indeed is founded on the relations of powers, as is so readily observed in the key relation of the ratio, *dy/dx*.

Hegel continues:

> Although the mathematics of the infinite maintained that these quantitative determinations are vanishing magnitudes, i.e. magnitudes which are no longer any particular quantum and yet are not nothing but are still a *determinateness* relatively to an other, it seemed perfectly clear that such an *intermediate state,* as it was called, between being and nothing does not exist.[i¥]

We have already seen that Leibniz—in his more mature, Spinoza-catalyzed thought—considered this "*intermediate state"* of the infinitesimal as a "necessary fiction"—in our terms, an operational bridge between the immanent and transitive-axes—and he got his key insight from Spinoza's *Letter XII*. Hegel is here reacting to, proliferating, or indeed partially generating, the exoteric/academic *mis*-reading of Leibniz discussed above, where Leibniz says that the infinitesimal is the number "just before reaching" zero.

> What we are to think of this objection and the so-called intermediate state, has already been indicated above in Remark 4 to the category of becoming. The unity of being and nothing is, of course, not a *state;* a state would be a determination of being and nothing into which these moments might be supposed to have lapsed only by accident, as it were, into a diseased condition externally induced through erroneous thinking; on the contrary, this mean and unity, the vanishing or equally the becoming is alone their *truth.*

Indeed, the "unity of being and nothing" is "not a *state*;" it's a fiction. The vanishing act, and the limbo-state itself, is a function of perspective from the relations between the powers of the transitive and Immanent/Transcendent axis—or number, and the positive infinity of the rational, respectively. The truth, as Hegel says—and as the aperspectival Vision-Logic Coordinate System demands and allows us to see—lies in the limitless becoming of the

[i¥] § 573

unfolding operations themselves. This is the nature of the interface between the finite and infinite; it results in indefinite or infinite becoming, depending on whether we are referring to practice or principle, respectively. And this is precisely the meaning of Spinoza's Triune Infinite. The infinitely small point is merely an aspect of The Infinite. The infinitesimal is a necessary fiction because this immanent zero can't be reached by the process of division—*dy/dx*—underlying the calculus. Its numerical significance in the transitive frame of reference of calculation merely falls off beyond a perspectival threshold, and, for the sake of practicality, we end our chase of this endless becoming.

Deleuze and the "Differential Point of View of the Infinitesimal Calculus"

Is Spinoza's example merely an illustration of the infinity of the variable curve—which, as we have seen, can be either transitive, transcendent or immanent in its direction—or is it specifically an illustration of the new VL-axis of the intensive relations of powers found in the ratio *dy/dx*? The latter opinion is emphasized by Deleuze in this 1981 lecture at the *Cours Vincennes,* transcribed and translated from the French [[my comments and ***emphases***]].

> Here is the figure that Spinoza proposes for our reflection [[recall Figure 59, above, p417]]: two circles of which one is inside the other, but above all they are not concentric. … Note the greatest and the smallest distance from one circle to the other. … Spinoza tells us something very interesting, it seems to me, he tells us: in the case of this double figure, you can not say that you don't have a limit or threshold. You have a threshold, you have a limit. You even have two limits: the outer circle, the inner circle, or what comes down to the same thing, the greatest distance from one circle to the other, or the least distance. You have a maximum and a minimum. And he says: consider the sum, here the Latin text is very important, the sum of the inequalities of distance. You see: you trace all the lines, all the segments which go from one circle to the other. You evidently have an infinity. Spinoza tells us: consider the sum of the inequalities of distance. … And he says: it is very curious, this infinity here. … is an infinite sum. The sum of the inequalities of distance is infinite. … And yet there is a limit. There is a limit since you have the limit of the big circle and the limit of the small circle. So there is something infinite and yet it is not unlimited. And he says that it is an odd infinity, it is a very particular geometrical infinity: it is an infinity that you can say is infinite even though it is not unlimited. And indeed, the space encompassed between the two circles is not unlimited, the encompassed space between the two circles is perfectly limited. I take up exactly the expression of the letter to Meyer: the sum of the inequalities of distance, even though he could have made the same reasoning by taking holding of

> the simpler case: the sum of unequal distances. Why does he want to sum up the differences?
>
> For me it is truly a text which is important, because, what does he have in his head that he doesn't say? He needs it by virtue of his problem of essences. Essences are degrees of power, but what is a degree of power? ***A degree of power is a difference between a maximum and a minimum. It is in this way that it is an intensive quantity. A degree of power is a difference in itself.***[i¥]

According to Simon Duffy in his, *The Logic of Expression in Deleuze's Expressionism in Philosophy: Spinoza: A Strategy of Engagement*, Deleuze, takes Hegel to task, and shows that the differential, or relation of powers, can indeed be seen in the geometrical example from what he calls the "differential point of view of the infinitesimal calculus," discussed briefly above.

Duffy writes:

> The derivative, from the differential point of view of the infinitesimal calculus, is the quotient of two differentials, that is, a differential relation, of the type *dy/dx*. The differential, *dy*, is an infinitely small quantity, or what Deleuze describes as 'a vanishing quantity'; a quantity smaller than any given or giveable quantity. Therefore, as a vanishing quantity, *dy*, in relation to *y*, is, strictly speaking, equal to zero. In the same way *dx*, in relation to *x*, is, strictly speaking, equal to zero, that is, *dx* is the vanishing quantity of *x*.

The differential relation can be written as *dy/dx = 0/0*. "However," says Duffy, "although *dy* is nothing in relation to *y*, and *dx* is nothing in relation to *x, dy* over *dx* does not cancel out, that is, *dy/dx* is not equal to zero." True, "there is no relation between two things which do not exist." However, Deleuze, like Leibniz, sees the differentials continuing to exist "as vanishing quantities insofar as they continue to vanish as quantities rather than having already vanished as quantities." They aren't *truly* zero, but merely *vanishing* beyond the horizon of the transitive mathematical imagination.

This is essentially the point of view already expressed by Leibniz, recall, which he honed through his 1676 encounter with Spinoza's *Letter XII* on the Triune Infinite, and it invokes Hegel's notion of a relation of powers *in action* or Becoming—the difference being that Deleuze sees this becoming in Spinoza's geometrical example, in that the numeration or numerical expression never comes to an ultimate end. The infinitesimal as zero (the nonexistence of power), is a necessary fiction. Rather, it continues to exist,

[i¥] Gilles Deleuze, translated transcript from a lecture at the *Cours Vincennes* dated 20/01/1981. http://www.webdeleuze.com/php/texte.php?cle=191&groupe=Spinoza&langue=2

to vanish, to *become* smaller and smaller, though we necessarily call it zero, in order to integrate the new immanence of rationality into the transitive and transcendent operations of pre- through post-rationality.

Duffy writes:

> Instead [of vanishing out of existence], the differential relation itself, *dy/dx*, subsists as a relation. 'What subsists when *dy* and *dx* cancel out under the form of vanishing quantities is the relation *dy/dx* itself' ... Despite the fact that its terms vanish, the relation itself is real.

The relation between the powers is still real because this vanishing act is merely a perspectival illusion; a function of a default, static, numerical frame of reference; the transitive axis, interfacing with motion beyond the immanent horizon on the Immanent/Transcendent axis.

> It is here [with this subsisting relation in the "differential point of view of the infinitesimal calculus"] that Deleuze considers seventeenth-century logic to have made 'a fundamental leap', by determining 'a logic of relations'.[30] He argues that 'under this form of infinitesimal calculus is discovered a domain where the relations no longer depend on their terms'.[31]

This domain is immanence, the sub-representational, the dark and mysterious yin. It has been encountered and explored since antiquity (perhaps most notably with Zeno), but not operationalized and legitimated, mathematically and metaphysically, until the seventeenth-century, and perhaps not "fully" until now with the deployment of the Immanent/Transcendent axis and the Vision-Logic Coordinate System of Nondual Rationalism and Interface Philosophy.

It is not quite accurate, or complete, however, that "the relations no longer depend on their terms," but rather that we no longer need to *represent* them as such, because the terms have receded beneath the mathematical detail of our limited (finite) and transcendent-biased view. They appear now as zero and we can no longer keep track of the still existing relation. Yet beyond this immanent horizon, we are forced to take seriously the immanent forces and the sub-representational field into which the terms have vanished and in which they must continue to exist, because we know, intuitively, logically and rationally, that the process of division in *dy/dx* cannot finally yield the "infinitely small" and the immanent rational zero—and this is the core intuition of the "differential point of view of the infinitesimal calculus." The space here is one of intensive forces, those between immanent zero and transcendent infinity, and no longer those oppositional forces between positive and negative trans-trans infinity.

According to the fundamental Principle of Nondual Rationalism and the Law of Absolute Reversal, *infinite* division [i.e. boundless division] does not "end" [bound] in the absolutely divided immanent zero, but reverses, at the

absolute scope, into its identical-opposite, the indivisible ONE. In other words, the immanent "terminal" is the identical-opposite of the transcendent. They are one in the same VL-axis: the twin poles of the positive infinity of rationality.

To put it in other terms, division *is* a relation—the relative scope in the art and science of pure relation—the identical-opposite of the absolute. There can be no end to division, and hence "infinite division"—without addressing or acknowledging its identical-opposite (such as in the PNDR)—is really a conflation of scope, an oxymoron, a "violation" of the Univocity Framework and nonduality. To say "infinite division," is (in terms of scope) to say "absolute relative," so, as in the PNDR, it rebounds into its identical-opposite, the indivisible.

Duffy continues:

> The concept of the infinitely small as vanishing quantities allows the determination of relations independently of their terms. 'The differential relation presents itself as the subsistence of the relation when the terms vanish'.[32] According to Deleuze, 'the terms between which the relation establishes itself are neither determined, nor determinable. Only the relation between its terms is determined'.[33] This is the logic of relations that Deleuze locates in the infinitesimal calculus of the seventeenth century, which he then mobilizes in his reading of Spinoza's *Letter XII*, and in his reading of Spinoza's work as a whole, particularly in relation to the physics of bodies in the second part of the *Ethics*.[34]

This point of view is what allows us to finally "perceive," legitimate and operationalize rational immanence and the intensive (non-oppositional and nondual) forces of the sub-representational. But it is the Immanent/Transcendent axis and its uncountable infinity that operationally represents the positive infinity of the rational and the subtle identity of opposites in Spinoza's Substance/God (respectively), rendering it the mathematical representation of the foundationless-foundation, the boundless Emptiness of Nondual Rationalism.

With this "differential point of view of the infinitesimal calculus" now in place, Duffy is ready to show us Deleuze's solution to Hegel's negation of Spinoza's use of the differential in his *Letter XII*.

> Deleuze argues that 'when you have a [differential] relation derived from a circle, this relation doesn't involve the circle at all but refers [rather] to what is called a tangent'.[35] A tangent is a line that touches a circle or curve at one point. The gradient of a tangent indicates the rate of change of the curve at that point ... or the amount of slope of the curve at that point. ... The differential relation is thought of as another function which describes, at each point on an original function, the gradient of the line tangent to the curve at that point. The value of this 'gradient' indicates a specific

> quality of the original function; its rate of change at that point. The differential relation therefore indicates the specific qualitative nature of the original function at the different points of the curve.

This was basic to Spinoza's point (no pun intended), that there are numberless (infinite) different "rates of change" in any interval along the space between the non-concentric circles, but he could have used any number of different examples of various curves and/or their relations to illustrate it. He chose circles, in my view, because he wanted to emphasize the *boundedness* and uncountable *immanence* of the 3rd order infinity. The point is that there are an "infinite number" of *immanent* differences in "specific qualitative nature" (in this case expressed as "inequalities of distance") to be found in any segment of any continuous, bounded curve. The image of the two circles just draws out this uncountable *immanence* of the Bounded infinite very clearly.

Duffy continues:

> ... To put it simply, to determine the tangent of a curve at a specified point, a second point that satisfies the function of the curve is selected, and the gradient of the line that runs through both of these points is calculated. As the second point approaches the point of tangency, the gradient of the line between the two points approaches the gradient of the tangent. The gradient of the tangent is, therefore, the limit of the gradient of the line between the two points. Deleuze contends that the maximum and minimum illustrated in Spinoza's geometrical example are suggestive of such limits.

In other words, using points to recursively divide the half-circle arc between the minimum and maximum distance between the circles (See Figure 60, below), we can draw a line between them to give us the tangent. As we move from the outer limit to the inner one, progressively dividing the arc segment, we endlessly approach the tangency of the minimum point (or we could work from min to max). At some point, due to the set scale of our drawing, we can no longer tell the difference between these two angles, or their respective differences in distance between the two circles, and the value *effectively* drops to zero, even though we know that with a true mathematical curve the division of powers will never end and the tangents and distances will never be fully equal.

Deleuze is certainly correct that the maximum and minimum in Spinoza's example are suggestive of these tangents-as-limits. It seems to me, however, beside the point to attempt to locate definitively the specific mechanism of the differential in Spinoza's example. As we have seen, Leibniz's solution to the problem of the calculus, and his mature understanding of the infinite came to him through his study of Spinoza's *Letter XII*, and all we need do, to further establish the alternate lineage from Spinoza to Leibniz—anticipating, transcending and including Cantor—is locate the "differential point of view

of the infinitesimal calculus" in Spinoza's example. This is already done, essentially, but we'll make it explicit here. But furthermore, we have already seen the uncountable infinity of the Immanent/Transcendent axis as the operational axis in his geometrical example, and underlying the positive infinity of esoteric rationality itself. This is infinity opened up in the functions of powers in their iopol-reversal into roots, recall, so indeed Spinoza's geometrical example demonstrates clearly the relations between such powers, just as do Zeno's famed paradoxes, as we will see.

The more clear reference to this "differential point of view of the infinitesimal calculus"—a point of view so critical and pervasive in Nondual Rationalism itself, as we have already seen with its Immanent/Transcendent axis—shows up in Spinoza's example in the sentence (my ***emphases***), "***However small a portion of it we take***, the inequalities of this small portion will surpass all numerical expression." This indicates directly that Spinoza is visualizing these two points on the continuous curve, giving the infinitely variable size on the Immanent/Transcendent axis between the two points and between the two circles, and essentially saying, before Leibniz, that no matter how small the infinitesimal division (differential or monad) in the "labyrinth of the continuum," there will be an infinity, or (to put it more accurately) "numberless" more divisions *within* it—it never reaches the point of zero. And the inverse, recall, Leibniz found as the solution to the labyrinth of the continuum, in that the implicit singularity of the immanent zero (the extensionless point) cannot be found but as an *abstraction* from the continuum itself, or, more precisely, as an abstracted immanent-local *aspect* of The Infinite. The unity of the continuum is logically prior to the mathematical point.

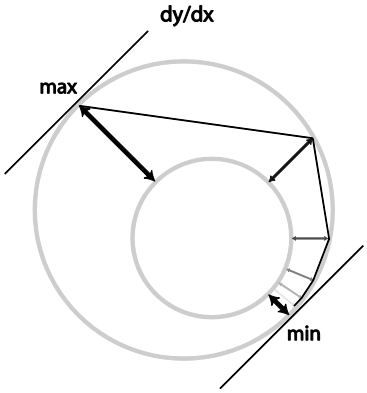

Figure 60: Limits on the Geometrical Example:
The min and max tangents can be seen, Deleuze contends, as the limits of the function, while the continued division of the arc progressively and perpetually moves toward that limit until the difference *appears* equal to zero. This, Deleuze contends, is the illustration of the differential in Spinoza's geometrical example.

Indeed, with his abandonment of the use of these oxymorons and absolute/relative conflations—"infinite number," "infinitely small" or "infinitely large," to be replaced by the more correct "numberless," etc.—Spinoza is subtly enacting the "differential point of view of the infinitesimal calculus," in that relative (bounded) functions such as scale, or number, are identical-opposite to the properties of the absolute scope, namely infinity.

The term "numberless," in the immanent context of division, softly enforces the differential view of the calculus as it enacts the Univocity Framework by explicating the understanding that the infinity is not a number which can be reached or bounded; the boundless is not a boundary, but they form a critical underlying polarity which is key to *both* mathematical and philosophical rationality. This in turn allows us to forestall the collapse of the infinitesimal into the infinite immanence of the rational zero, and maintain its positive value as a necessary function of transitive operations.

The main point of connection for this alternate lineage, in my view, is that the immanent uncountable infinity of the "labyrinth of the continuum" opened up stepwise and albeit incompletely by the higher level function of the mathematical ratio, and inherent in any continuous curve or line, is the essence of mathematical rationality and the calculus. This, Spinoza firmly grasped, and indeed, in 1676 informed Leibniz of, via his earlier infamous *Letter XII*.

> So, according to Deleuze, the gradient of the tangent functions as a limit. When the relation establishes itself between infinitely small terms, it does not cancel itself out with its terms, but rather tends towards a limit. … Since the differential relation approaches closer to its limit as the differentials decrease in size, or approach zero, the limit of the relation is represented by the relation between the infinitely small. It is in this sense that the differential relation between the infinitely small refers to something finite. Or, as Deleuze suggests, it is in the finite itself that there is the 'mutual immanence'[36] of the relation and the infinitely small.

When Deleuze suggests "it is in the finite itself that there is the 'mutual immanence' of the relation and the infinitely small," he is referring directly to the role of the immanent pole of the Immanent/Transcendent axis in the bounded (3rd order) infinite [my *emphasis*].

> The formula for the problem of the infinite that Deleuze extracts from the geometrical example of *Letter XII*, by means of this seventeenth-century understanding of the infinitesimal calculus, is that '*something finite consists of an infinity under a certain relation*'.[37]

The relation is the mathematical ratio which opens the infinity of rational immanence, and its intensive forces through the violation of the closure property of the integers, and specifically of the "unit-closure" of the unit-identity. Through this opening an infinity is indeed revealed or generated within every boundary, segment, unity or number. That was the simple point of Spinoza's example.

> Deleuze considers this formula to mark 'an equilibrium point, for seventeenth-century thought, between the infinite and the finite, by means of a new theory of relations'.[38] It is the logic of this theory of relations that provides a starting point for the investigation into the logic that Deleuze deploys in *Expressionism in Philosophy* and which can be

> traced through *Difference and Repetition* as a part of his project of constructing a philosophy of difference.

We will not have time to trace out the Deleuzian project in full, but some of its elements have made their way into this resonant thread.

> The Deleuzian solution offered to the problem of the infinite distinguishes itself from the Hegelian solution insofar as it is not resolved according to the dialectical logic. Deleuze's thesis is that the differential cannot be classified within the dialectical logic, which asserts the opposition of the infinite and the finite.

As we have seen, in Nondual Rationalism the finite and infinite form a polarity. Each is meaningless without the other. In Interface Mathematics, the root of the finite, the unit number one, is formed volumetrically or intensively on the Immanent/Transcendent axis.

The "opposition of the infinite and the finite" is a purely transitive and pre-rational view, and in Nondual Rationalism it is critically an *identity* of opposites, a polarity directly in line with the Nagarjunan polarity of Emptiness and form, respectively.

> Instead, Deleuze sets up Spinoza's example of the relation between the infinite and the finite as a rival metaphysical framework for the resolution of the problem of the infinite, a rival to that provided by Hegel in the dialectical logic.

The more explicit and empowered rival is the operationalization of the Immanent/Transcendent axis in the rational numbers, with the move from the positive and negative (oppositional) relations of addition and subtraction, to the relations of intensity in the infinite space opened up between unity (numerical identity) and immanent zero in the violation of the closure property by the inversion of the input/output polarity in the mathematical ratio.

The relation between the infinite and finite can be seen in the Triune Infinite as the 3rd order infinite, itself an interface between the transitive and immanent/transcendent axes, becomes the nondual interface between the infinite and finite. Duffy continues…

> Given that the method of integration provides a way of working back from the differential relation, the problem of integration is, therefore, how to reverse this process of differentiation. This can be solved by determining the inverse of the given differential relation according to the inverse transformation of differentiation. Or, a solution can be determined from the differential point of view of the infinitesimal calculus by considering integration as a process of summation in the form of a series, according to which, given the specific qualitative nature of a tangent at a point, the problem becomes that of finding, not just one other point determinative of the differential relation, but a sequence of points, all of which together satisfy, or generate, a curve and therefore a function in the

> neighbourhood of the given point of tangency, which therefore functions as the limit of the function.
> Deleuze considers this to be the base of the infinitesimal calculus as understood or interpreted in the seventeenth century. The formula for the problem of the infinite that Deleuze extracts from the geometrical example of *Letter XII*, by means of this seventeenth-century understanding of the infinitesimal calculus, is that 'something finite consists of an infinity under a certain relation'.[37] Deleuze considers this formula to mark 'an equilibrium point, for seventeenth-century thought, between the infinite and the finite, by means of a new theory of relations'.[38] It is the logic of this theory of relations that provides a starting point for the investigation into the logic that Deleuze deploys in *Expressionism in Philosophy* and which can be traced through *Difference and Repetition* as a part of his project of constructing a philosophy of difference.

Duffy writes earlier, "Deleuze actually locates the differential from the differential point of view of the infinitesimal calculus in the geometrical example of Spinoza's *Letter XII* by implicating Leibniz's understanding of the early form of the infinitesimal calculus..." As we have seen, however, even Leibniz seems to have gotten his own mature, unproblematic, yet esoteric, understanding of the infinite largely from his 1676 studies of Spinoza's letter XII. This, recall, was what enabled him to solve the problem of the infinitesimal and to abandon the naïve principle, prefiguring Cantor.

TO INFINITY AND BEYOND: TUNING AND TRIUNING THE PARADOX

EVERYTHING THAT ARRESTS THE MOVEMENT OF THOUGHT IS FALSE. Consequently the real, true progress of thought exists only in the widest possible striving towards knowledge, a striving which does not admit the possibility of resting on any forms of knowledge already found. The meaning of life lies in eternal seeking, and only by seeking shall we ever find new reality.

— P. D. Ouspensky, *Tertium Organum*

Albert Camus argues that Sisyphus is a heroic figure. Sisyphus gains victory in defeat; the very attempt to do the impossible ennobles him. Some philosophers justify the struggle with paradoxes in the same defiant way. … Happily there is no need for heroism. History shows that most paradoxes are short-lived. Each generation's sample of paradoxes is biased toward leftovers that have resisted past efforts.

— Roy Sorenson, *A Brief History of the Paradox*

THE ACATEGORICAL PERSPECTIVE AND THE LOMA

In his book *A Brief History of the Paradox*, Roy Sorenson writes that paradoxes are "questions (or in some cases, pseudoquestions) that suspend us between *too many* good answers." A paradox, Sorenson points out, finds its strange stability in the dynamic equilibrium between two necessary conclusions from a single question, premise or point of view. "From engineering, we know that this kind of dynamic equilibrium is most simply achieved by symmetry. When two boards are propped up against each other (like this: /\), their equal but opposed forces keep the pair standing."

To whet our appetite with a simple example, Sorenson asks, "When an amoeba divides in two, does it go out of existence?" The amoeba has not perished but merely transformed, so "no" she hasn't gone out of existence. Yet she is no longer one individual but two—she has transformed too much—so "yes" she *has* gone out of existence. The swinging pendulum of the answer, of course, depends on the implicit fuzziness or imprecision of our general category of *individual identity*—the "it" of which the amoeba implicitly is … or was … a special case. On the one hand the amoeba has successfully *multiplied* its identity by two. So, not only does "it" still exist, but in twice the quantity. On the other hand, the identity of the amoeba has been *negated* in this very act because "to say that the mother amoeba continues as the pair of daughters conflicts with the idea that organisms are unified individuals."[i¥] And to satisfy our *singular* or "unified" idea of individual identity it is an arbitrary matter to trace the single trajectory of the mother amoeba's identity through *only one* of the daughters she has become. The mother amoeba *was* an individual organism, yet, without perishing, suddenly she is *no longer* an individual. She has actually divided, and now each daughter would seem to be merely one half of the "dividual" that was once the *individual* mother amoeba. The individual has *died* to become the dividual.[ii]

But what has actually been divided out of existence other than rigidity of our implicit *category* of organismic individuality itself? What has been lost but the applicability of a category generated in the anthropocentric frame of reference of sexually reproducing beings and then implicitly applied to the asexually reproducing amoeba? It is the category of organism as indivisible

[i¥] (Sorenson)

[ii] This is close to the inverse-identical to the Borg crisis of identity in assimilation. Instead of a simple agglomeration, this is a multiplication through division. And for another inverse-identical in the Leibnizian "problem of sex," see Monadic Immaculate Conception and the "Problem of Sex", p683).

then, which when implicitly misapplied causes this dichotomy of not quite right conclusions we perceive as a paradox. The intrinsic precision of the actuality cannot be reached by the imprecision of the extrinsic boundaries of the category, and so we oscillate between the two closest approximations: the mother amoeba has not died so she still exists, yet, in a real sense, she has gone out of existence.

Paradoxes, then, are errors of intrinsic incompatibility in a compartmentalized, categorical and *dualistic* logically descriptive system. Paradoxes are dualisms. It is not in Nature herself that the dualistic compartmental incompatibilities of the paradox reside, but only in the oppositional categories cast upon her from above. From a different vantage point, then—e.g. from a more detailed system of categories—we will see that the paradoxes can, and often do indeed disappear. This disappearance can come not simply by avoidance or turning away, and not necessarily by "refutation," but by the very opposite, by explicitly modeling the pivotal detail inaccessible by the categorical framework rendering and generating the paradox. Indeed the acategorical perspective of Nondual Rationalism and Interface Philosophy provides a vantage point from which a new system or level of categories can be constructed, with the resolution of the paradox in mind. This is a large function of Interface Philosophy and the Vision-Logic Coordinate System: to provide the acategorical and aperspectival framework for such transformations to take shape. But this nondual system was already built largely to resolve the dualistic paradoxes in a nondual fashion—such as those of the infinite—as we will continue to see.

A system of categories can be thought of together as a transitive net cast over a much more detailed and sub-categorical terrain. This is similar to the artificial lines of nations drawn and redrawn across a continent—sometimes along the contours of rivers or mountain ranges, but often merely representing compromises between warring nations or competing states, rendered as straight lines criss-crossing the territory in a purely *ad hoc* geometrical fashion.[i]

The category, then, serves a transcendent and transitive (trans-biased) representational function of power over the territory *beneath* the category—this territory being namely emergent "meaning" and sub-representation. Language or syntax in this sense is thus transcendent to and emergent from semantics or embodied meaning. Yet syntax, in turn, symbiotically modulates semantics from above, serving as a medium or lens through which embodied meaning can be manipulated and further elevated. And so from this already emergent vantage point it often seems as if semantics were

[i] … and often times for the very purpose of conquering a region through this division of the collective power of its people.

emergent from syntax, but the fact is that once syntax emerges, they are symbiotic and co-dependent. They each engender the development of the other. And it is the attempt of syntax or language and its rigid categories to represent and modify the fluid contours of deeper semantics and sub-representation (sub-semantics) that can often lead to the symmetric opposition between two such rigid categorical conclusions.

In the EOTC, categories and concepts multiply through division, forming an ever expanding and deepening meshwork of internal categorical opposition—a sprawling system of polarities operating as opposable conceptual appendages for grasping various differences in the mind. In the paradox, however, we have reached the immanent limits of the categories as they currently exist. We have reached the "limits of minimum (semantic) ambiguity"—the LOMA, as Gerald Lebau calls it—afforded by the particular evolutionary state of our system of categories. And if there is no implicit understanding of the oppositional nature of categories and representation—in the context of the intensive forces of sub-representation—then a contradiction is conceived as something to be refuted and rejected from above, rather than as possibly evoking a deeper truth beyond the oppositional categories of the particular representational system.

The category representing the organismic individuality of the amoeba, for example, is like the rigid board in the above image (/\ ), in contrast to the underlying continuity, possibility and fluidity of the semantic and sub-semantic territory which it divides. When mapped to a set of facts which it doesn't intrinsically fit—namely the *dividual* nature of the amoeboid identity—the category-system equivocates back and forth (yes and no, / and \), trying to reach the intrinsic detail which its boundaries obscure (/.\). Thus the category, expressed through the linearity of language and conceptual thought, takes turns siding against itself, attempting to triangulate on a detail, made inaccessible by the rigidity of its boundaries. Like trying to pick up a toothpick while wearing boxing gloves, the system of categories is too unrefined for the task. In this simplistic case, the inaccessible detail is the fact that individual identity is not applicable to all organisms, such as the amoeba, and a new category or distinction of organismic existence as a divisible identity ("dividual") is thus needed.

Paradox and the LOMA: A Geometrical Example

A simple analogy of the paradox emerging from the LOMA (limits of minimum ambiguity) can be drawn from representational systems in general. For example, imagine that there exists a representational system whose categories are rigid line segments of a specific and fixed size, but of variable position and angle. Everything the system represents, then, must be essentially polygonal, according to that size and line-segment as unit. The representational layer, however, is only one half of the whole system,

because there must be something for the system to represent. The other half is a sub-representational foundation which autonomously and unconsciously generates problems and then feeds the unfolding consequences and solutions in real time to the representational layer to be displayed in the form of lines, or collections of lines, such as polygons. As such, the system is unaware of any of its processes (analogous to thoughts) as anything other than polygonal. It knows only its polygonal representations and not the problems and solutions represented from the deeper sub-representational and subconscious level. This is a polygonal consciousness which sees the world through a purely polygonal lens.

One day a curious image spontaneously emerges into the display. A shrinking series of polygons appears—smaller and smaller until finally: hexagon, pentagon, square, triangle … but then suddenly the display jumps back to the square, then again to the triangle … square, triangle, square, triangle… The sub-representational system has converged into a rapid oscillatory state, flipping the representational layer back and forth between the triangle and the square. The form appearing in the consciousness of the system—as the representational answer to the particular sub-representational problem—seems to be *both and neither* a square and a triangle. The shape in consciousness is a duality—a contradiction, a controversy, a paradox.

But what the representational layer (and the consciousness of the system itself) doesn't know is that the sub-representational form being converged upon is a circle whose diameter is smaller than the line segment. The system is simply trying to represent the *area* of this circle. However, this quantity just happens to be a number *exactly* between the quantities representable by the areas of the two smallest possible polygons: the square and the triangle (See Figure 61, below). The square is too large a polygon to accurately render the radius and area of the circle, and the triangle is too small. But the real problem is that the area of the circle happens to lie *exactly* in the center between the two, and the system's only possibility for coming to rest on the nearest representational state is a sub-representational rounding function that jumps to the *nearest* numerical value. In the extremely rare case of convergence upon a perfect balance where the sub-representational system ends up in the actual absence of a nearest representational state—i.e. in perfect dynamic equilibrium or symmetry between two states where there actually *is not* any *one* such nearest state—the system enters an oscillation between the *two* nearest states, in effect averaging its area over time between them.

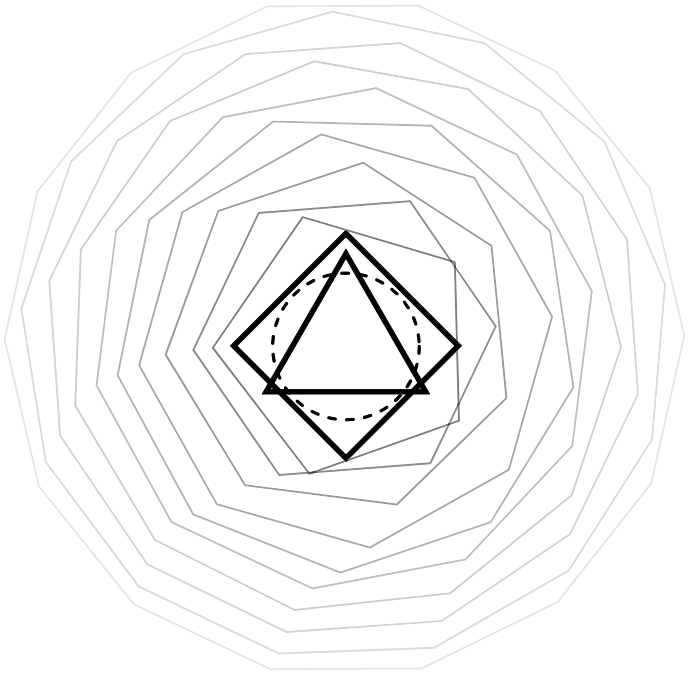

Figure 61: The LOMA and the Paradox: A Geometrical Example:
The "limits of minimum ambiguity" (LOMA) as leading to a paradox or controversy can be shown through the geometrical example above. In this example, the area of an unknown circle is being computed by a sub-representational and subconscious system and then displayed and brought into awareness by a representational layer of categories made of line segments of a specific size. The explicit and categorical consciousness of this system then is purely polygonal, unconsciously getting its ever-changing form and impetus from its deeper sub-representational basis. In this case, the area of the subconsciously computed circle lies *exactly* between the two possible representational or conscious configurations of the square and the triangle. The sub-conscious system has no mechanism by which to come to rest on one of the symmetrically opposed representational configurations and thus it begins to oscillate between them, averaging them over time. The shape in representation is a paradox—a duality—a square-triangle or a triangle-square—while the computation in the subconscious is a singular and consistent whole. We have two competing consequences or answers, and without knowing or intuiting the sub-representational shape which they are both attempting to approximate, it may be impossible to know that both answers are as correct as possible (yet quite incorrect) given the limits of the representational system itself.

Unfortunately for the system as a whole, it is unaware of the causes of this oscillatory state, because it cannot see the sub-representational problem, functions and solution, except through its own polygonal representation. What is sees is simply an oscillating triangle-square or a square-triangle: a

paradox, with a corresponding "principle of complementarity." In other words, it can't see outside its own system of representation: it can't take an aperspectival stance in which it could operate with categories of representation which are not lines of that particular and fixed length.

Even if the system can't get outside itself, however, if it could instead "pulverize" its categories into much smaller bits, it could then represent circles of a smaller size and the system would then see the "paradoxical" square-triangle for what it is, just a small circle. This is the value, then, of the acategorical perspective in the context of the Immanent/Transcendent axis: it allows us to recognize the transitive limits of categories themselves, and that sometimes their rigidity can converge into a symmetrical oscillation between two equally valid and *ultimately* incorrect or limited solutions to a deeper unknown problem. As in the simplistic case of the amoeba, very often when using rigid categories to render an explanation, which the categories were not designed to fit, we end up equivocating on two equally good (and bad) explanations or conclusions.

The category, then, is like a system of pixels with which we can ever more accurately represent our world. And the paradox occurs at the limits of minimum ambiguity—the LOMA—of our categorical system. The nondual or acategorical perspective, then—tuning and triuning the paradox—would be the *anti-aliasing* function between the two closest approximations in the particular categorical system. The truth of a paradox occurs generally as the cultivated third between both of the answers (/|\), and the falsity of the paradox lies in the limits of accuracy of the system of categories themselves, including both of its paradoxically opposed answers.

This is the simplest "answer" to the paradox, which was honed in the nondual traditions themselves. Opposites, such as the opposing conclusions or categories of the paradox, are simply acknowledged as intrinsic elements of each other. Like yin in yang, and vice versa, they are "identical opposites." Nondual traditions *embrace* the paradox because they know that the problem is one merely of representation (illusion or Maya), in a dualistic and oppositional set of categories. The problem sometimes happens then that in the embrace of the paradox, they can often tend to hold onto it as essential to reality or nondual philosophy itself. The paradox must be remembered as a *dualistic* function of illusion and perspective, and it must be conceived free from dualistic attachment in order to retain the possibility of seeing it as one, from a different categorical perspective.

Recall, however, that the forces of opposition are central to the transitive-axis and to representation itself, whereas sub-representation deals with the forces of intensity operationalized by the Immanent/Transcendent axis. As in mathematics, a new set of categories (identities) is reached immanently, in the breaking of closure of the previous set, and this occurs in the intrinsic context of the Immanent/Transcendent axis in the Vision-Logic Coordinate System.

Paradox as Transitive Illusion of Perspective

The artificial modularity, transitive rigidity and compartmentalization of the category, then, is key to the maintenance of the illusion of the paradox. Sorenson explains this, naturally, in conjunction with our *paradoxes of sensation*, the optical illusions:

> After gazing at a waterfall, Aristotle saw the bank of a river apparently moving—while simultaneously appearing stationary! … Psychologists think the dissonance [[of optical illusions]] is irresolvable because our visual systems are compartmentalized. Each mental module contains, as it were, a little man (a homunculus) who makes rudimentary judgments. …
>
> For the sake of speed, the judgments of homunculi are based on a small number of criteria and a few simple rules for processing the limited data. There is no time for communication and deliberation. Consequently, homunculi are dogmatic. They often lock into disagreement. Illusion is the price that must be paid to evolve perceptions that can keep up with a dynamic environment. … When all the good answers to a riddle are the verdicts of a system composed of homunculi (such as the ones undergirding vision and speech), then the conflict is not rationally resolvable. …
>
> The paradox might go away because something *causes* the conflicting homunculi to stop judging. Some perceptual illusions disappear as we age. A paradox might also be tolerable because we can hold an irrational tendency in check (as when a self-controlled air traveler ignores his fear of falling) or because we come to embrace it (as when a lover embraces his jealousy). But there is no *reasoning* with homunculi.

Because our category of organismic existence, for example, and its beginning and ending points at birth and death, are so tied to the category of the organism as *individual*, we have difficulty when that category is pulverized by the actuality of the organism as *dividual*—as presented by the amoeba. How do we make sense of this kind of "individual" who is at the same time *divisible*? How can we keep track of the infinitely multiplying trajectory of this kind of identity … without generating new transitive patterns and perspectives of categories immune to pulverization by this kind of instance?

This, of course, is the general answer to the paradox. If we want a resolution to the paradoxical dualism—rather than just a traditional Taoist embrace and acknowledgement of its status as illusion—then we must create a new system or deeper layer of categories which exposes and renders explicit the pivotal detail hidden and inaccessible to the paradox. A traditional example would be Nagarjuna's invention of the categories of Emptiness and Form, which he used to pulverize the dichotomy of the nihilists and essentialists.

As Einstein once said—the solution to a problem cannot be solved by the same mind or system of concepts that generated it. The function and motion of the acategorical imperative, recall, was precisely this: to seek ever more

expansions, transcensions-and-inclusions and differentiations-and-integrations through the immanent pulverization of the categories. Recall again our recent example with the "pure" categories (identities and operations) of mathematics, and that it is always with an *immanent* direction of operation that the transitive mapping, or rooting of transcendence (trans-bias) is overcome, leading to a "violation of closure" and a transcension-and-inclusion into a new set of categories or numerical identities.

But much of the function and results of the acategorical imperative of the rational has already been transcended-and-included and differentiated-and-integrated into the Vision-Logic Coordinate System, which then operates as our meta-perspective from which the problems of the paradoxes will naturally unravel.

Sorenson states:

> Common sense may seem like a seamless, timeless whole. But it really resembles the earth's surface; a jigsaw puzzle of giant plates that slowly collide and rub against each other. The stability of terra firma is the result of great forces and counterforces. The equilibrium is imperfect; there is constant underlying tension and, occasionally, sudden slippage. Paradoxes mark fault lines in our common-sense world. Do these fissures reach into reason itself?

This final question can simply and effectively be inverted. Can reason itself, through the acategorical imperative, reach into the categorical fissures of common-sense—the paradoxes—and find their common-ground in some kind of deeper level of fluidity and emergence—some nondual form of rationality that resolves paradoxes naturally?

To a great degree, we will find that paradox traces the very "backbone" of nondual philosophy. It follows the curves of the "axis of Univocity"—where the absolute meets the relative scope of logic and rationality—as it winds its way through the transitive and agglomerative categories of thought itself. This is why the paradoxes cluster around the interface between the quantitative aspects of scope—the finite and infinite—as seen so clearly with the paradoxes of Galileo and Zeno.

We will find, then, that what is central to the resolution of the paradox is the relation between the transitive-axis—with its forces of representation and opposition—and the Immanent/Transcendent axis—with its forces of univocity and intensity. Recall that it is the transitive-axis that is the root of the identity of the category and thus of singular perspective and its logical operations. The dissolution of the illusions of perspective—the pulverization of the categories—then, through the aperspectival Vision-Logic Coordinate System, itself centered on the Immanent/Transcendent axis, will be key to the resolutions of the paradoxes of the infinite herein.

Through the remainder of this section on the paradoxes of the infinite, we seek a new "plane of consistency," an aperspectival "immanent plane" within which the paradoxes readily dissolve. Given that there are hundreds of paradoxes in existence, we'll pick and choose only a few that can serve as models of the Interface Philosophy method of resolution. But we've already glimpsed this "plane of consistency" and methodology in action with our principles of Nondual Rationalism. We've seen, for example, the paradox of free-will vs. determinism form through the category error between the relative and absolute scopes. And we've seen it dissolve just as readily through the univocal Principle of Absolute Reversal, giving us the Principle of Infinite Determinism: "infinite determinism equals indeterminism." We've seen a similar thing with the problem of continuity and infinite division, where—according to our Principle of Nondual Rationalism—infinite division equals indivisibility. But notice again that all of these paradoxes and problems arise at the interface between the quantitative aspects of the absolute and relative scope—the infinite and finite, respectively.

This can also be seen in light of Spinoza's distinction between the infinite and the imagination. The imagination imposes its own finite limits (e.g. perspectives)—the forces of representation—on the infinite, generating the false infinite of the indefinite. In turn we will also see the maintenance of the transcendent-bias and its forces of representation as key to the stability and confusion surrounding many paradoxes, such as Zeno's. And with the disintegration of the transcendent-bias through the balancing rational immanence of positive or deep infinity, comes the rapid dissolution or integration of Zeno's carefully propped up oppositions, rendering the apparent duality into the necessary polarity underlying the whole of Nondual Rationalism and Interface Mathematics. And we will explore, as well, the controversies surrounding Cantor's revolutionary transition beyond our classical notions of infinity into the "transfinite," and again our Vision-Logic Coordinate System will be key to unraveling the problems. We will find, however, that Cantor's transfinite illustrates and clearly outlines the contours of Spinoza's Triune Infinite—his Bounded or Modal Infinite as the primitive infinite number—and the global binary structure of the holarchical embryogenesis of mathematics itself, as we have seen. The transfinite is fundamentally two-tiered, matching precisely the holarchical structure of Interface Mathematics, in its binary VL-axes and the transition of operation thereupon, between the first and second "tiers" of number and operation.

GALILEO, CANTOR AND THE TRANSFINITE

To Infinity… and beyond!
— Buzz Lightyear

While Cantor's transfinite arithmetic is not necessarily paradoxical, it is indeed still controversial, and a controversy is essentially a paradoxical dichotomy diffused through the social sphere into warring camps, each spawning from and/or reacting against the same fundamental premise or point of view, inaccessible by the same categories underlying the dichotomous representations on both sides of the controversy. The purpose here, then, is to further explain—tune and triune—the dichotomy and duality at the core of the Cantorian controversy.

Recall again this quote from Galileo [my **emphasis**]

> So far as I see we can only infer that the totality of all numbers is infinite, that the number of squares is infinite, and that the number of their roots is infinite; neither is the number of squares less than the totality of all numbers, nor the latter greater than the former; and finally **the attributes "equal," "greater," and "less," are not applicable to infinite, but only to finite, quantities.**" — Galileo Galilei, On two New Sciences, 1638

This is the classical, philosophical wisdom that infinities, as boundless, cannot be compared as bounded magnitudes or numbers, according to the part-whole axiom implicit in human percept-based thought. But the fact that we are even talking about "infinities" (plural) tells us that we are not dealing with the ALL is ONE, the 1st order Absolute Infinite, but only with either 2nd or 3rd order infinities, Aspect or Modal. It is also clear that the set of all squares, or all even numbers, is transcendent and unbounded, and at least by the process of elimination that would leave us with the aspect infinite, for a quick and easy resolution to the Galilean paradox.

Indeed, it is very easy to see the squares as the "aspect of squaring" the natural number-line, or the evens as the "aspect of 'even-ing,'" (the counting by twos of the infinite set of the Natural numbers), and by the quantitative principle of Infinite Unity (infinity in operation with anything else equals infinity) we end up, *naturally* (pun intended), with infinity. Likewise the Natural numbers are themselves an aspect of counting, or set-generating by ones, and are already a 2nd order, or aspect infinite.

Galileo's simple unexplained-but-necessary conclusion that infinite quantities cannot be compared, shines a crucial light on Cantor's abstract principle of the infinite hierarchy of transfinite sets. The goal is to give a vision-logic interface for clearly and simply understanding the necessity of Galileo's correct conclusion, as well as the conclusions of Spinoza, Leibniz, Cantor and others. But also we seek to explain the real meaning behind Cantor's pragmatic codification of the paradox into encapsulated symbolic form in the redefinition of the infinite underlying the "transfinite," as well as his resolution to the Galilean paradox.

As we saw in the Pearl Principle,[i¥] Cantor had to embrace the paradoxes of the infinite and codify them into an operational principle, in order to advance mathematics beyond the conundrum, at least at an operational, syntactic level. To do this in the language of mathematics—and operating on his own *implicit* tri-partite distinction, but without the nondual *understanding* that comes from Spinoza's Triune Infinite—he ultimately had to treat the infinite set in *purely* mathematical terms, and so the paradox was only solved *syntactically* or operationally, not semantically or sensibly. Recall that infinity is no longer simply defined as boundless and that "…the defining property of infinity today is that a set's cardinality is equal to the cardinality of some real subset of that set."[ii¥] This, again, is simply a codification of the truth of the paradox as found by Galileo, et al. It is not a *sensible* explanation or resolution of it.

This failure to *sensibly* or modelably resolve the paradoxes, is why the controversies remain. They don't just hang around because some luddites are resistant to change and want to live in the past. Something was indeed lost in this paradigm shift—a "Kuhn-loss" of the simple understanding of the infinite as boundless. And in the shift to modern axiomatic set theory, with sets as abstracted to the bare-bones of the category, there was a corresponding loss of the implicit holarchical model of sets underlying the human imagination, and making *sense* of the polarity and interface between the finite and infinite. This fix, while indeed a positive outgrowth for mathematics, was a transcension-and-negation, not a transcension-and-inclusion of the truths of philosophy and experiential understanding, interfacing with the infinite.

The holarchical model of sets implicit in the human mind lost in the rejection of the part-whole axiom, was to be replaced only with the abstractions of categories and their rules for relation and inter-transformation in modern axiomatic set theory. But recall again that it was this Kuhn-loss in the abstraction to the category itself that engendered the early paradoxes of set theory, such as Russell's paradox. And recall also that

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[i¥] See, The Polarity of the Finite and Infinite, p221.

[ii¥] Dr. Reviel Netz, NOVA interview

much of the modern machinations of axiomatic set theory to reign in these paradoxes have brought these holarchical truths back in the form of abstract rules and axioms—thus bringing modern set theory itself back into line with part-whole axiom which it had earlier rejected, but from a much greater operational vantage point, i.e. less "naïve." This is indeed why modern set theory is now compatible with "mereology," the study of the relations of parts to wholes.[i]*

It is these meta-mathematical controversies, not the mathematics or set-theory itself, that we aim to fix, offering a new *integration* of the paradox with an *understanding* now afforded us through the *differentiation* of Spinoza's Triune Infinite, but in the context of Interface Mathematics we have installed up to this point. The pre-rational undifferentiated infinite simply could not (and cannot) accommodate the distinctions being made at the interface of the infinite and finite, and this resulted in conflations of the prefused distinctions; con-fusion and paradox. But recall that Cantor as well had a tri-partite distinction of infinity. His model, however, unlike Spinoza's, was far too simplistic and categorical to resolve the paradoxes—its distinctions having no intrinsic functions and operable definitions such as to provide for the triune interface of relations amongst themselves needed to effect an integration.[ii]*

But Cantor's "Absolute Infinite," like Spinoza's first-order Infinite, is inoperable; it can't relate. So Cantor, as we have seen[iii]*—operating at his *third* and lowest level of mathematical, abstract infinity—devised a way to place a value or cardinality on the *counting aspects* of the infinite sets by means of "Hume's Principle." The controversy here, recall, surrounds the assumption that the familiar one-to-one correspondence—used already in the Galilean paradox between the Natural numbers and "perfect squares"—can provide a means for assigning or comparing cardinality between infinite sets. And for the Rationals, Cantor invented a new method of one-to-one correspondence with the Natural numbers which he called "diagonalization," showing that the Rationals as well are of the same cardinality as the Natural numbers, i.e. they are "countable."

This "countability," along with the acceptance of Dedekind's redefinition of set—or the blurring, ambiguating encapsulation of the part-whole violation into the very definition of an infinite set—gave Cantor the means to further redefine number away from the implicit holonic logic of sets, by comparing infinite sets themselves as numbers. If, for instance, one set could not be put into a one-to-one correspondence with the Natural numbers, or was "uncountable," it was deemed a higher magnitude or

[i]* See, Implicit Holonic Set-Theory and the Part-Whole Axiom, p207.

[ii]* See, Cantor's Three Infinities, p268.

[iii]* See, The Polarity of the Finite and Infinite, p221.

cardinality. But recall Cantor's comparison of the "irrational" numbers to his infinite numbers,[i]* and that with this new function of number we had already broken from the classical notion of number as boundary into numbering aspects of infinity. *Naturally* Cantor found that the set of Real numbers, with its "irrationals" and "transcendentals" was "uncountable" and together considered the next order of infinity, not aleph null, but aleph one.

The Two-Floors of the Transfinite

Recall the binary logic of the VL-axes. In Cantor's transfinite we can see yet another manifestation of this dual or polar nature fundamental to mathematics. The countable infinite is the first level of infinity and all the higher levels are uncountable. But the countable and the uncountable correspond directly to operation on the transitive and immanent/transcendent axes, respectively, in their interfacing throughout the holarchical embryogenesis of mathematics. Where the function of number escapes the quantized limits of the transitive, we break into the Immanent/Transcendent axis and from the oppositional into the purely intensive forces of infinite depth. And recall this happened explicitly, for example, with the iopol-inversion of powering, to the function of rooting and its breaking open to "irrational" or transrational (e.g. transcendental) numbers. This division between the Rationals and the Reals is precisely the breaking point between Cantor's countable and uncountable infinities, and it is precisely the point where the function of number and operation moves fully onto the Immanent/Transcendent axis, at the "second tier" level of powers and roots.[ii]*

The nondual-rational or trans-rational view of the Triune Infinite—initiated pre-Cantor by Spinoza and expanded by Leibniz—demonstrates a more *sensible* way to understand Cantor's insights, while keeping all of his important mathematical and operational advances intact. In this view it is made explicit that the "cardinality" or magnitude of an infinite set—or an infinite number—is of a very different type from the cardinality of a finite set. The difference is that a number—empirically, in its most common and primitive or fundamental forms—is a boundary (or even a "bounded" or modal infinite, in the case of the irrational numbers), whereas an aspect infinite, such as an infinite set is inherently unbounded.

Infinite sets are conceived as algorithmic *aspects* of set generation ("set aspects" or "aspect infinities") abstracted from the ONE absolute Infinity. It *seems* they have magnitudes, or we can *abstract* magnitudes or powers out

[i]* See, The Trans-Rationality of the Irrational Numbers, p365.

[ii]* See Phase FIVE: The Trans-Rational as Second Tier, p342.

from their interactions or interfacings—because we think of them *in terms of magnitudes*, i.e. from numerical and operational frames of reference (algorithms) from which they are generated. But really these set-aspects are abstractions from the same Absolute Infinite (absolute scope) divided up, abstracted or interfaced in different algorithmic ways (e.g. "countabilities").

Cantor's insight about transfinite orders of infinity[i¥] was essentially that every *mathematical* and "abstract" infinity or infinite set has within it an *aspect* of the finite, in the Spinozist sense that, "in its kind," it can be *surpassed* by another power of infinity, or another infinite set.[ii*] In this way, each mathematical infinity also has a finite "kind," or aspect, which can be compared with other mathematical infinities. Indeed, as Cantor showed, each kind or aspect can be superseded by an apparently "infinite number" of higher-power aspect infinities. This aspect of the finite in every mathematical infinity is because the 2nd order infinity, the Aspect Infinite, is derived in the *interface* between the finite and infinite, in a quantitative frame of reference such as a *set-generating algorithm*. An example of such an algorithm would be the ratio of two integer variables ultimately generating the infinite set of the rational numbers.[iii*]

Thinking of The Infinite as absolute and numberless, means that one cannot operate between absolute (aspect-less and ineffable) infinities (of which there can be only ONE-ALL); one cannot add, subtract or compare the magnitudes of The Infinite because The Infinite is not a magnitude, number, part nor whole and in the EOTC it has not yet interfaced with the finite. As the abstract identical-opposite of the relative scope—generated, recall, in the univocal application of polarity to itself[iv*]—The Infinite has no internal conceptual relation or multiplicity which can be abstracted free from the derivative relation of the aspect infinite or its modal interfaces, which are its conceptual modalities—its *senses*. Abstraction into relation *is* this interface. What is compared, added and subtracted etc. in the transfinite orders of axiomatic set theory, are the various abstracted quantitative *aspects*, the algorithmic relations, "order types," and set-generators of The Infinite *in relation to the finite*, not The Infinite itself. This, recall, Cantor clearly outlined in his own three-fold categorization of infinity, by separating his "Absolute Infinity" from both his second order contingent infinity (or the infinite in the real world) and from his third order mathematical and abstract infinity, such as his transfinite orders.

[i¥] Notes from *Spinoza's Finite Modes: Explained or Explained Away?*: 1997 Carl Brock Sides

[ii*] See, A Foot in the Door to Paradise: Cantor's Quick Fix, p228.

[iii*] See, The Holarchical Unfolding of Number and Operation, p306.

[iv*] See, The Univocity Framework (UF), p153.

Summary: The Nondual/Interface Definition and Resolution of the Nature of Infinity

In Nondual Rationalism and Interface Philosophy, we can retain the original general definition of infinity as boundless (*apeiron*), and simply provide it with a deeper level of detail via our Spinozan triune differentiation. This allows us to follow Cantor himself in a tripartite distinction, but with even more explanatory detail. This detail allows us to explain how the triune differentiation itself is formed in the interface between The Infinite and the finite. And further we can see how sets are abstracted with aspects of the finite (set aspects) in their very creation. It is this finite aspect in every infinite set which is compared and ordered in Cantor's infinite series of transfinite sets, not The Infinite itself. We can then apply our quantitative principle of Infinite Unity: "infinity in any operation returns infinity," given by our VLE for Infinite Unity, $\infty\Omega n = \infty$. In the context of sets, then, the boundless set is equal to its subsets as a natural function of the quantitative principle of Infinite Unity, as would be expected from the absolute scope in our Univocity Framework. Because set theory is ultimately concerned with the unity of the category, then, it abstracts infinity to its most basic categorical properties in the context of unity, which we have abstracted as the quantitative principle of Infinite Unity. Given the modern mathematical reduction to set theory itself, this explains why the mathematical definition of infinity collapses to the set-theoretic definition which is merely a holarchical function of our quantitative principle of Infinite Unity, as a pure-relational abstraction of the ineffability of the absolute scope in our Univocity Framework.

BACK TO ZENO

> *When one dives into endlessness, in both time and space, farther and farther without stopping, one needs fixed points or milestones past which one speeds. ... At every border crossing between one compartment and the next, his clock ticks. Whoever wants to create for himself a universe in a two-dimensional plane will notice that time goes by while he is working on his creation. ... When he is finished, however, and looks at what he has done, then he sees something that is static and timeless. In his representation, no clock ticks. Only a flat, motionless expanse is revealed.*
>
> — M.C. Escher, *Approaches to Infinity*

> *... Zeno's arguments pull infinite rabbits from finite hats.*
>
> — Roy Sorenson, *A Brief History of the Paradox*

Zeno is reputed to have invented some forty paradoxes. But the myriad proposed solutions are almost as old as the paradoxes themselves. For example (and as we shall see in more detail), Aristotle employed the distinction between actual infinity and potential infinity to attempt a quick and easy refutation of Zeno's paradoxes of motion. And, as discussed previously,[i]* it is generally assumed that Zeno's paradoxes were finally and definitively solved by Cantor's transfinite arithmetic and the modern mathematics of the continuum. As explained by Sorenson:

> Alfred North Whitehead remarked, "To be refuted in every century after you have written is the acme of triumph ... No one ever touched Zeno without refuting him, and every century thinks it worth while to refute him." (1947, 114) I think this compliment will not be paid by future centuries. There are still paradoxes involving hypertasks. None of them overturns the verdict that all of Zeno's paradoxes were solved by Cantor a hundred years ago. Cantor's triumph shows that some important paradoxes can be solved. We now have answers to Zeno's riddles that satisfy the exacting standard set by modern mathematics. Twenty-four

[i]* See, A Foot in the Door to Paradise: Cantor's Quick Fix, p228.

> hundred years is a long wait. But remember that the comparison was with Sisyphus, who labors for eternity.

Our purpose here is likewise not Sisyphean. We aim not merely to give yet another purported resolution to the general Zenonian paradox, but to render the problem and its proposed solutions in the clear light of Interface Philosophy and the Vision-Logic Coordinate System. Indeed, we will come to see explicitly why Zeno's paradoxes hold such an enduring fascination for us, and why Cantor's abstract solution works. What we will find, however, is that far from being an error in itself to be refuted, resolved and corrected, the duality at the heart of Zeno's paradoxes is a transitive, categorical symptom of the fundamental *polarity* of conceptual relation itself which Zeno's pioneering thought experiment deftly tapped into. In the end, Zeno gives a tantalizing glimpse of the fundamentally polar or nondual nature of conceptual relation which won't be operationalized mathematically into the modern infinitely divisible and indivisible continuum until Cantor and others in the nineteenth century, and which won't be fully assimilated into the social sphere until a truly rational and nondual framework of thought (e.g. Interface Philosophy and Nondual Rationalism) works its way through the collective consciousness of mankind. Until then, humanity may continue to "*refute*," rather than to *understand* the seemingly paradoxical polarity at the heart of Zeno's thought experiments, as they inch their way closer and closer to functionality with Zeno's "paradoxical," and ultimately Parmenidean truth. To understand this truth, then, we must come to understand Parmenides and the Pre-Socratic context in which it arises.

Swirling in the Presocratic Soup

Between around 600 to 400 B.C.E, the trajectory of "Western" thought begins to leave its trail as the rudimentary stirrings of "the history of philosophy." In his book *The Truth About Everything*, Matthew Stewart demonstrates that from these early, "pre-Socratic" fragments a compelling story of conceptual embryogenesis and evolution can be pieced together which will echo and recapitulate throughout the rest of the history of philosophy. Stewart explains:

> …it will become apparent that everything that would be said in philosophy over the subsequent two and a half millennia had already been said in some way by the Presocratic philosophers. The battles among the Presocratics over first principles would be relived in an astonishing variety of forms, but always with the same outcome.

Throughout this embryogenesis can be seen a transformation in the attempt to define first principles, which themselves were wrested into abstraction from the anthropomorphic tales of the Near Eastern and Greek gods. From these early theological yarns and songs the first principle unfolded as a unitary Chaos, Night or Nothingness—"muck," as Stewart calls it. From this

muck emerged "elemental figures, i.e. gods, who fight among themselves for control of the world..." Like the beginnings of mathematics itself, the elemental gods begin in direct opposition and duality, polarized against one another in countless battles which through subsequent generations ultimately civilized the dark of Chaos into the dawn of an uneasy and capricious order of operations.

The first recorded attempt to abstract this originary "muck" into rational thought as a "first principle" came with Thales and his principle of water, from which all the other "elements" would arise. Like the battles of the elemental gods themselves, this water principle was then objected to by subsequent philosophers, not on the grounds of empirical observation, but as a matter of self-derived authority and logic. Anaximander, for example, recognized that in order for a first principle to spawn all the elements it cannot itself be an element. Thus he chose the boundless itself—the *apeiron*—as his first principle. Anaximander reasoned that this *apeiron* contained within itself the potential of all the elements, while possessing none of their individual limits. Mirroring or echoing the implicit EOTC itself, the Anaximandrian elements are simply *separated out* of or abstracted from the unbounded unity of the *apeiron*. "In effect, by naming a stuff which is not one of the everyday stuffs we know, Anaximander removed the paradox involved in describing the whole class of stuffs in terms of one of its members" (p42).

But history ebbs and flows, from progress to a seeming regress, all the while gaining new (if hidden) traction in its endless explorations. Anaximenes, for example, dissatisfied with the ineffability and abstractness of Anaximander's *apeiron*, selected air as his first principle, with the advantage that he could describe how air could be condensed into fluids and further into solids, and then liquefied and rarified back into fundamental air. But at the same time he stepped back into the paradoxes of describing the class of elements with another member of the same class. Subtle is the way of nonlinear and massively parallel progress.

From Muck Into Form

Heraclitus was the first philosopher to break from early Ionian first principles as some kind of muck. In a subtle echo of Anaximander's *apeiron*, Heraclitus exchanged the problem of how stuff can change into other stuff, with the more abstract idea that change itself was the primordial "stuff." For this reason he poetically described his first principle in terms of fire because it is more of a process of transformation—e.g. from twigs and branches into smoke and ashes—than a stuff or an element. Through this ceaseless transformation, however, the ever-changing form of the fire remains. In this sense, Stewart reasons, Heraclitus, like Pythagoras, successfully and fully transitions from stuff to form or abstraction as the first principle.

Essentially, Heraclitus selected the nondual and triune interface between the dual states of any transformation as his primal "stuff." In this same way, goes the common Heraclitean maxim, "you can't step into the same river twice," because the water in the river is always influxing anew, and the river itself is constantly in a process of change. It *is* change. This cultivating third of *change* in Heraclitus was formalized into the principle of "logos," which can mean anything "from 'word' to 'story' to 'account' to 'proportion' or 'measure.'"

Implicit to Heraclitean logos, we can see, is the essence of the nondual, in that through it, Heraclitus reasoned, opposites ceaselessly transform into one another, because in the deepest sense they *are* one another. This, we can see, is a pre-echo Parmenides' Being-now and an echo Anaximander's *apeiron* and it expresses an uncanny resemblance to Nagarjuna's pulverization of the categories and Buddhist dependent arising. "In this synthesis of opposites, by the way, Heraclitus foreshadows for us a feature of philosophy that will remain with us for the course of this history. The drive for unity is perhaps the primordial urge of philosophy, and in the end it must run over all the (merely apparent) oppositions which populate the world" (p44). The "Heraclitean paradox," or what we can call a nonduality, Stewart reasons, "takes us to the bottom [our absolute scope] of the very idea of a first principle," which, as we have seen along with Heraclitus, reflects into its opposite.

> A first principle presumably is the form of everything. So what is the form of everything? Well, it cannot be a particular form, like water or squareness, for any such particular form would be dissolved into its opposite through the form of—form. The form of everything, in other words, is form itself. Everything, Heraclitus tells us, is part of the form of the world. But to say that form itself is the first principle is to present an argument in the form of a circle. The very idea that there is such a thing as a first principle supposes that there is a form of the world. The premise of the search is its conclusion.
>
> We could end the history of philosophy at this point. In Heraclitus' inspired hands, philosophy dissolves itself. It falls silent. But in this Heraclitean world, alas, nothing ever comes to rest. Philosophy will crystallize again and again, in countless new shapes, throughout the course of our history.

Parmenides and Second-Order Philosophy

Breaking the nondual silence of the Heraclitean absolute scope of infinite difference—with change and nondual inter-transformability itself as the first principle or logos—Parmenides moves into the contemplation of what a first principle must look like. Through Parmenides, then, the history of philosophy transitions into self-reflection—a second-order, recursive "philosophy of philosophy," which takes into account the nature—the limits

and possibilities—of the philosophical concept itself. Parmenides, then, moves philosophy into a rudimentary and implicit post-ontological contemplation of ontology as a development (or embryogenesis) *of the concept*, rather than simply of stuff itself. Stewart explains:

> From this second-order perspective [Parmenides] rules out many of the other Presocratic's attempts, draws his own conclusions about reality, and articulates the central strategy of much of philosophy to come. … The decisive move in Parmenides' thought is to lift philosophy into the new territory of methodology. The choice he offers us … is between competing ways or roads. The Greek word is *hodos*. From this comes the "hod" in our own word "method." Parmenides is the first of the Presocratics to distinguish clearly between first-order investigations into the nature of things and second-order investigations into what it is possible to investigate, or between methods and methodology. This move to a second order is characteristic of philosophy to the present day. What will later be given the fancy names of *ontology, metaphysics, epistemology*, and *logic* are combined in a single Parmenidean move (p45-7).

This leap moves Parmenides into an aperspectival and primitive integral stance on philosophy itself—a second tier, of sorts. And in this process Parmenides recognizes that the Heraclitean infinite difference of the ALL can only equate to the ONE of "Being" itself.

It is in this sense of emphasis on the unity and identity in the ALL, then, that Parmenides argues for the ONE of his "Being-now." He does not argue against his senses, as is commonly supposed, that there *is* no difference (e.g. motion or change), but merely that difference is relative and when taken absolutely—to the first principles with which the early philosophers were so concerned—it reflects into its opposite, the ONE of Infinite Unity. For Parmenides then, *ultimately*—but only ultimately—there is only the ONE, and his pupil Zeno will demonstrate this point over and over by equivalence through the ALL in his many and varied paradoxes of plurality, as we shall see.

Corso and Recorso: Self-Similarity in the History of Philosophy

We have already witnessed a bit of a crude echo into the very beginnings of philosophy. This came with the recapitulation of the ancient theological transition from muck into elemental gods, in the early philosophies of the Presocratics, with their muck-like first principles spawning the elements of the world. Stewart demonstrates quite effectively, however, that this kind of repetition is ubiquitous throughout the history of philosophy, as the truths of the previous generations are reduced to the LCD of the next, or simply just forgotten to be rediscovered anew. To conclude an earlier brief account of

this self-similarity, we take up where we left off with our previous quote from Stewart [my comments]:

> … everything that would be said in philosophy over the subsequent two and a half millennia had already been said in some way by the Presocratic philosophers. … Parmenides' leap to the second-order in particular could be seen as the paradigm for almost all of ancient and modern philosophy. Aristotelian metaphysics as the study of being *qua* being would be one refinement of Parmenides' project. Descartes' discourse on method would be another, as would Kant's investigations into the conditions of the possibility of experience. The forthcoming dialectics between reason and the senses, between divine and human knowledge, were already mapped out by Heraclitus' skepticism about the transient world of ordinary sense experience, not to mention Parmenides' distinction between the way of truth and the way of mortals [echoing the Buddhist doctrine of Two Truths]. The Parmenidean One would merge with Spinoza's Substance, and its seedy Anaxagorean response would sprout again in Leibniz's pluralistic monadism. Leavened with the Heraclitean logos-flux, a reinvigorated Anaxagorean Mind, and the Zenoian dialectic, the One which is Many would return to itself in the form of Hegel's Absolute Spirit. The … question of Being would become the first principle of Heidegger's philosophy. Heraclitus' intuitive misanthropic genius, his attempt to forge new values out of a dead cosmology would express itself again in Nietzsche. … His faith in a seamless form of the world, one which could be shown but not said, would be shared by Wittgenstein. The mysticism of both Eastern and Western philosophy was already laid out by Pythagoras, Heraclitus and Empedocles. Zeno's hair-splitting paradoxes would first drive the Socratic dialectic, and then become the conceptual clarifications of mid-twentieth century philosophy of language [as well as logic and mathematics, we might add.]
>
> The list could go on and on. Yet it should not be taken as evidence that the Presocratics decisively influenced the course of the philosophy that was to come, or that the subsequent history of philosophy constitutes some sort of logical development out of these originary problematics. For most of the rest of the history, it is more likely that the Presocratics were pretty much forgotten or misinterpreted. Philosophy, as we shall see, repeats itself blindly. …
>
> The myth of the origin is just another way in which philosophy makes itself into what it is. Even the Presocratics were referring constantly to a past, to another beginning in cosmology...

Indeed, we have already seen (and will continue to see) how the exoteric forces of representation have flattened and misrepresented Spinoza's philosophy, only to be renamed and reinvented anew. For example, and as Will Durant previously mentioned, Hegel flattened Spinoza's absolute scope of Substance to a principle of the same, and subsequently re-appropriated and renamed its lost truths into his own Absolute. And we shall see a similar thing now with Zeno's logical demonstrations of the truths of Parmenides, as it winds itself blindly, through distortion and "refutation" into our modern Cantorian understanding of infinity and the continuum.

Plurality is Unity: Zeno's Core Paradox

Naturally our story must peal off from this self-similar historical trajectory with Zeno of Elea, as the intellectual heir to the "original" second-order philosophy of Parmenides. As Stewart said, "Zeno's hair-splitting paradoxes would first drive the Socratic dialectic, and then become the conceptual clarifications of mid-twentieth century philosophy of language." And, we can add, Zeno's paradoxes also forced into the open, critical distinctions in logic and mathematics, and continue to do so to this day, culminating with the validation and instantiation of Zeno's Parmenidean conclusions into the truths of modern mathematics, as we will indeed see.

As Karin Verelst and Bob Coecke argue—in their paper *Early Greek Thought and Perspectives for the Interpretation of Quantum Mechanics: Preliminaries to an Ontological Approach* [my ***emphasis***}:

> [Zeno's paradoxes] stem from what was perceived by classical philosophy to be *the* fundamental enigma for thinking about the world: the seemingly contradictory results that followed from the co-incidence of being and non-being in the world of change and motion as we experience it, and the experience of absolute existence here and now. The most clear expression of both stances can be found, again following classical thought, in the thinking of Heraclitus of Ephesus and Parmenides of Elea. ***The problem put forward by these paradoxes reduces for both Plato and Aristotle to the possibility of the existence of stable objects as a necessary condition for knowledge.*** Hence the primarily *ontological* nature of the solutions they proposed: Plato's Theory of Forms and Aristotle's metaphysics and logic. Plato's and Aristotle's systems are argued here to do on the ontological level essentially the same: to introduce stability in the world by introducing the notion of a separable, stable object, for which a 'principle of contradiction' is valid: an object cannot be and not-be at the same place at the same time. So it *becomes possible* to forbid contradiction on an epistemological level, and thus to guarantee the certainty of knowledge that seemed to be threatened before.

In the exoteric history of philosophy, then, the paradox and univocal polarity (the "co-incidence" or interface) between the absolute (the omni-non of Being and non-Being) and relative scopes ("the world of change and motion as we experience it") was naturally *prior* to the closure and absolute identity of the concept, as we see in Plato's Forms and Aristotle's principle of contradiction, his metaphysics and his logic. This originary absolute-relative polarity in the *axis mundi* of ancient thought, we will see, manifests into the opposition of the concept through Zeno's derivative "paradoxes," and finally, now, into the unity, polarity and triune interface of the Immanent/Transcendent axis and the Cycle of Unity.

In order for the certainty and rigidity of subsequent philosophical and "Rational" thought to progress, then, it had to move again from this originary intensive "muck" of fuzzy nonduality and polarity, into the numerical identity of the category and the transitive and transcendent (trans-biased

and agglomerative) forces of opposition, for example in the principle of contradiction. For Plato and Aristotle, then, contradiction—literally "opposing words," such as an identity of opposites—becomes fundamentally threatening to ontology itself, and its manifestations must be refuted in order to be resolved. Whereas before them—such as in Heraclitus and Parmenides, and generally the whole of early Eastern nondual philosophy—contradiction was accepted in an essentially nondual and necessary way. This is why the beginning of exoteric "Western" and "Rational" philosophy is felt to really start only with the general "refutation" of the Presocratics by the triumvirate of "Rationality" and Order themselves; Socrates, Plato and Aristotle [i] —pushing the "pre-Socratics" into the fuzzy, confused and "conflicting" twilight zone of our Western proto-philosophical and "pre-rational" horizons—back into the muck and Chaos from whence they came. (It is indeed known, however, that Plato himself, towards the end of his philosophical progression, recognizes a critical problem in his own philosophy of Forms, in relation to the philosophy of Parmenides.)

Naturally, as should be apparent, this progression mirrors precisely—though in a much more complex form—the holarchical embryogenesis of number and operation—the rarified categories of pure relation—from the originary, pre-operational and implicit Immanent/Transcendent axis, through the oppositional and dualistic forces of operational representation, and finally into second-tier integration and operation on the originary Immanent/Transcendent axis. Rationality itself, then, we can see, begins its operational, historical and exoteric trajectory in duality with the closure of the concept, as the categorical object begins in opposition to other such objects. Differentiating-and-integrating, transcending-and-including, upward and outward Rationality transcends into higher and higher forms, approaching closer and closer to the second-tier operationalization of its hidden and con-fused nondual origins, and ultimately into exoteric operation on the ONE-ALL of the Immanent/Transcendent axis, the originary axis-mundi implicit throughout this entire evolution.

We can see this process most strongly indeed with the function of Zeno's ubiquitous paradoxes, which, through repeated attempts at refutation in every subsequent generation, slowly forced into awareness and into mathematical and now philosophical operationalization the truths at its core—namely, as we shall see, the triune interface of the two fundamental VL-axes of conceptual thought, and the fundamental Principle of Nondual Rationalism (PNDR).

Through the whole of subsequent (post-Socratic) exoteric and uni-logical philosophy and mathematics, the Immanent/Transcendent axis and polarity

[i] But this is not to say that they each don't have their nondual elements, just that their emphasis pushed philosophy, and necessarily so, into the forces of opposition and conceptual, trans-biased agglomeration.

underlying Zeno's "paradoxes" would appear simply as a contradiction, an "error" needing refutation and resolution. This polarity, then, winded its way through various interpretations and "refutations," each of which injecting non-Zenonian premises in order to collapse the "paradox" into a workable refutation—but with each resolution, rationality inches its way closer and closer to truths hidden within.

As Verelst demonstrates in her article *Zeno's Paradoxes. A Cardinal Problem*, virtually *all* of these so-called "refutations" artificially introduce, in various guises, the concept of time into Zeno's instantaneous procedure of second-order division. This results, as Verelst shows, in the confusion between potential and actual infinity, first found in Aristotle, but recapitulated in different forms in all the "refutational strategies up to the present." Indeed, when Zeno's Parmenidean legacy and purpose is made clear, it will be seen that even Cantor's "solution" is not so much a refutation as an acknowledgement that Zeno merely exposed a fundamental property of conceptual or mathematical "space." And this resolution merely takes the form of a codification, operationalization (and ultimately a vindication) of Zeno's key findings into our modern notions of the continuum, finally resolving—but merely operationally, not conceptually, sensibly, or "philosophically"—the notorious pre-Cantorian problems of the continuum. Indeed, as Verelst demonstrates in rigorous mathematical detail, the form of Zeno's simultaneous "through and through" division mirrors precisely Cantor's "Continuum Hypothesis" itself, and the uncountable, second-tier infinities unreachable by time-ordered or "stepwise" operations such as "supertasks."

Post-Socratic Scope Con-Fusion

"Whatever it was that was refuted," says Verelst, "it was certainly not Zeno." Generally what has been "refuted"—along with the exoteric caricatures of Zeno and Parmenides—are the purely unsubstantiated and absurd views they never held, such as the simple nonexistence of things and change. In the common versions of history—what Verelst calls the Received View—it is said that both Zeno and Parmenides rejected their sense data that everywhere showed evidence of the plurality of things and change. Yet every child knows that these comic characters are dead wrong. It is further claimed that these patently absurd ideas—e.g. no things nor change—were supported merely through Zeno's purely logical paradoxes, taken collectively as *reductio ad absurdum* (more like a *reductio* ***into*** *absurdum*, for the sake of convenient "refutation") .

From the start, for example, Plato fictionalizes an interaction between Zeno and Socrates for this very purpose, however consciously or unconsciously: to make Zeno's stance appear absurd and make tractable and possible its subsequent *refutation*. Plato writes in his *Parmenides*

(demonstrating clearly the scope con-fusion we'll discuss below) [my ***emphases***]:

> … Is that the purpose of your argument—to maintain against all comers that ***there cannot be a many***? And do you regard each of your arguments as proof of this, so that in your view the arguments put forward in your treatise are just so many proofs that ***there is not a many***? Is that right, or have I misunderstood you?"
>
> "No," said Zeno, "you have grasped admirably the whole purpose of the work."[i¥]

That "there *is not*" nor "*cannot be* a many?" How ***many*** words must this Zeno character employ in his proof of this miraculous conclusion that there is but ONE word? Can he not count past *ONE…* errrr *… one*? An absurd character indeed, this "Zeno"—on par with the solipsist who tries to convince others of his unique and controversial views. Indeed, this Zeno *would* be a solipsist, if the many of his peers, and the many details of his environment simply do not exist. If there is only one, then Zeno must be it! Why then write those *many* words, my dear Zeno? To convince those *many* people of the truths of your master Parmenides? Sorenson comments:

> Many of the mathematicians and physicists who present Zeno's paradoxes assure their readers that Zeno is not crazy. They say he is just challenging us to clarify our ideas. But the above passage from Plato suggests that Zeno is not interested in prompting us to develop better theories of familiar phenomena. Zeno contends those phenomena do not exist. When an atheist asks, "Could God make a stone so big that he himself could not lift it?" he is not inviting the theist to develop a coherent theory of omnipotence. The atheist is using the stone paradox to refute the possibility of God. Zeno is equally destructive. Zeno wants to serve his teacher Parmenides by exposing the absurdity of all rival positions.

Sorenson continues in same vein, claiming that Zeno himself makes the same point directly to Socrates. But recall that Plato's "Zeno," like his "Socrates," is a fictionalized character, serving Plato's own aims. Further note that Plato has a direct antagonistic interest in refuting Zeno and Parmenides, in order to bring categorical stability to philosophy through his theory of the Forms. Thus his rendition of either character is indeed to be suspect. Sorenson gives the pulpit again to Plato, where he continues fleshing out his fictional antagonist Zeno against his protagonist Socrates. "Zeno" says [my ***emphases***]:

> The truth is that these writings were meant as a kind of support to the arguments of Parmenides against those who try to ridicule him by saying that if ***the whole is one***, many absurdities and contradictions follow. This treatise of mine is a reply to those who say ***that there is a many***, and it pays them back with interest; for it shows that consequences still more

[i¥] Qtd in (Sorenson).

> ridiculous follow if ***what is*** is a many than if it is a one, if you pursue the matter far enough.

Plato again radically distorts Parmenides' view as merely against "those who say [simply] ***that there is a many***." But even Plato can't distort Parmenides views entirely out of sight. He simply glosses over the distinction that the Received View also fails to see. The clues here, I have highlighted. Parmenides, via Zeno, is talking about "the whole," "what is," i.e. Being itself. He is talking about the absolute, not the relative scope of everyday experience. Parmenides rejects the view that the *absolute* is a many and not a ONE, not merely that the many of the relative scope doesn't exist. Indeed, "*if you pursue the matter far enough*," is precisely the point. Taken to the absolute scope of first principles, as Zeno shows, the experiential reality of the many becomes the concept of the ALL which reflects into the ONE of the Parmenidean "Being-now."

While Sorenson and Plato may feel that Zeno and Parmenides are merely being contrary and destructive, mathematicians know first hand the constructive value in Zeno's work. Much of the advances in modern mathematics were indeed formed in response to Zeno's paradoxes and, as we will see, they ultimately vindicate it.

Through analyses of the original Greek texts Verelst et al demonstrates further that the Parmenidean legacy is drastically misunderstood. This legacy, Verelst shows, is a "phenomenological realism" and nowhere does Zeno deny the phenomenological or relative reality of plurality and change. "Zeno's arguments are not a *reductio*, if only because the logical prejudice that something which implies paradoxes cannot 'really be there' is itself still unthinkable, since hypothetical thinking does not yet exist. When one speaks, one does so not about a possible world, but about this world...."

In other words, it was not the case, in the ancient world, that a paradox about something necessitated its nonexistence. Indeed, the only first-hand testimony we have of Zeno's views is that from Simplicius who had in his possession Zeno's book of paradoxes from which he occasionally quoted. Simplicius states that [my ***emphases***], "In [Zeno's] book, in which ***many*** arguments are put forward, he shows ***in each*** that ***a man who says that there is a plurality is stating something contradictory***." Note first how absurd would be Simplicius' own statement and first-hand account about the "many arguments" of Zeno, if he felt they proved the very impossibility of the many. Secondly, note that *in* ***each*** *paradox*—presumably including the paradoxes of motion—Simplicius states that Zeno merely demonstrates that *plurality* is paradoxical, not that *motion* is paradoxical, and certainly not that the many of things and motion are *nonexistent*.

Recall that Parmenides was operating at the level of a second-order philosophy. This is the distinction which is not being taken into account by

Plato with his fictionalized Zeno, Parmenides and Socrates. The Received View, then, is a scope con-fusion. At the relative scope of the everyday ontic and epistemic interface there is no such denial of plurality and motion whatsoever. But Parmenides and Zeno were primarily concerned with *first principles*, and hence with the absolute. And by taking it to the absolute scope Zeno merely demonstrates that the infinite division of plurality is logically equivalent to the indivisibility of Unity, and subsequently that logic and rationality, at its core, is fundamentally polar and nondual—"contra-dictory" in the face of absolute Unity.

But this is a given, since polarity is the most general function of the world of conceptual relation, which of necessity includes the world of logic. In his paradoxes of motion, we will see plurality expressed through the infinite divisibility of change, and through the same underlying form the simultaneously infinite division of time is demonstrated to be the equivalent of the indivisibility of eternity manifesting in the Zenonian instant. Motion, then, is not so much denied, as demonstrated to be indivisible, continuous and *ultimately* ONE eternal and instantaneous Unity—the Parmenidean Being-now. And this is naturally in conjunction with our PNDR, "infinite division equals indivisibility," and its Ariadnean resonance into the chord of "infinite determinism equals indeterminism" and its eternal-NOW.

Parmenides, Heraclitus, and the Cycle of Unity and VL-Axes

It indeed seems to be the case, then, that the Parmenidean legacy (echoing Anaximander's *apeiron*) consists generally of an *emphasis* on the Unity, rational harmony or indivisibility aspect of the fundamental identity and univocal tautology of the ONE-ALL, whereas the Heraclitean (and Anaxagorean) legacy would emphasize its multiplicity, diversity and conflicting aspects in the infinite division, difference and change of the ALL. (Indeed, as we will see, this is the same polarity and triunity of emphasis underlying the perceived and received view of the dichotomy between Spinoza and Leibniz, respectively.) In the interface and "shock" between these two, however, we find the unity in triunity—the nonduality and resolution to all the resonant dichotomies, dualities, conflicts and paradoxes—but most importantly, this resolution comes not at the price of a negating refutation, but with the integrating shift in perspective into a vision-logic framework whereby the polarity underlying the fundamental "paradox" of Being itself becomes visible—tuned and triuned—as a singular omni-axis of thought and conceptual/ontological unfolding—namely the axis-mundi or I/T axis.

This "atonement" in triunity can perhaps be seen most clearly with our Cycle of Unity between the Infinite and finite forms of unity—the ALL-ONE and the "one," respectively. This, recall, can be seen as an orbit, where the axis-mundi of the immanent/transcendent ALL-ONE, cycles back through its

tautological identity with the ONE-ALL. To enter the orbit and approach the finite unity of the "one," however, from the identity in transcendence between the ONE-ALL omni-axis and the ONE-one uni-axis, recall, the cycle moves (simultaneously from immanence and transcendence) onto the uni-axis and toward its bounded interface in the closure of the categorical unit-identity—the unit of the transitive-axis. Then—through the equality of immanence and transcendence in the ratio of the ALL (∞/∞)—the conceptual cycle moves back to the ONE. This, recall, is represented in our VLE — *ONE = ALL = ∞/∞ = ONE* — which itself represents the tuning and triuning binary cycle of emphasis between the Parmenidean unity in the ONE, and the Heraclitean conflict in the ALL.[i]* The solidus/vinculum between the immanent and transcendent infinite in our VLE (∞/∞), recall, is the very interface of our finite unity, implicit in the ONE-ALL from the beginning. See Figure 15, repeated below.

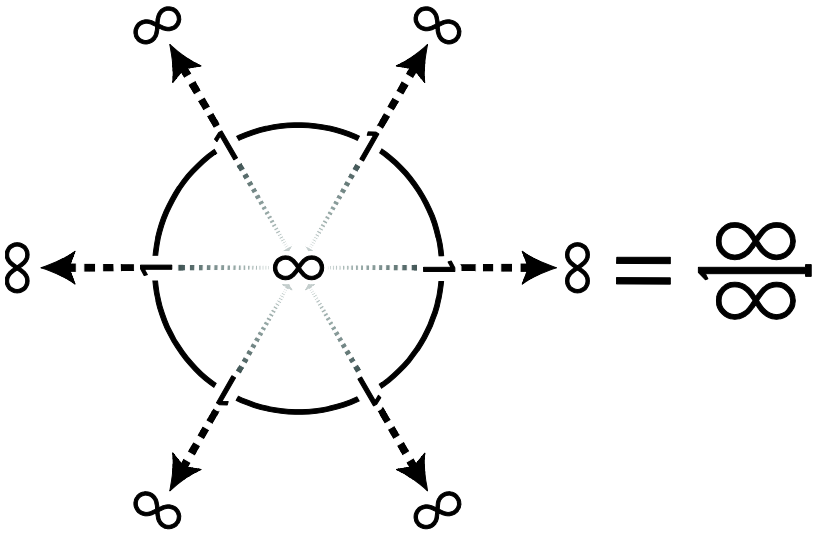


Figure 15, Repeated from *The (Binary) Cycle of Unity* (p255): Polarity of the Forms in the Cycle of Unity.

Most importantly, however, this Cycle, recall, also reflects through the pure-relational categories of mathematics into *The Binary Cycle of Identities, Axes*

[i]* See, The (Binary) Cycle of Unity, p254.

and Unities (p381), which acts as the triuning interface between the two fundamental VL-axes of conceptual relation: the I/T and the transitive. These binary VL-axes, recall, also represent operational aspects of the uncountable and countable Cantorian infinities, as we have just seen in the recent section on Cantor.[i*] Indeed, we will soon see the interface between these two VL-axes and their Cantorian infinite aspects as essential to the understanding—the tuning and triuning—of Zeno's paradox.

Through con-fusion in the oppositional exoteric forces of representation, Zeno's "paradoxes" force into awareness a glimpse of the nondual foundations of conceptual and categorical thinking itself. It will be shown that the refutational reaction to Zeno's thought experiments directly employ the trans-bias, while conflating the pre-fused distinction between the two fundamental VL-axes of pure-relational and categorical thinking: boundedness and extension on the transitive axis and boundless immanence on the immanent/transcendent axes. Indeed, we will see that these two VL-axes—and their implicit binary cycle of relation—show up explicitly in both Zeno's original logic underlying all of his paradoxes, and in Verelst's mathematical demonstration and reconstruction. It is precisely due to the trans-bias that Zeno reaches the Parmenidean ONE *only* through immanence, just as we saw mathematics itself ever and only reaching into new identities and unities through immanence against the pervasive agglomerative functions of the trans-bias.

Sorenson echoes the exoteric con-fusion between these two axes when he states, "… Zeno's arguments pull infinite rabbits from finite hats." Indeed, what Zeno shows is essentially what Cantor and Spinoza show, the existence of the bounded infinite—or the infinity of the bounded—and the polarity and identity of opposites between infinity and number; e.g. the infinite number. The finite *is* the infinite and the infinite the finite—in the same way that form is emptiness and emptiness form. This perfectly harmonious foundationless-foundation is the bottomless hat from which the mathemagicians (even today) have always pulled "infinite rabbits from finite hats."

Simultaneous Division "Through and Through"

As Verelst demonstrates[ii¥]—and Simplicius confirms "he shows ***in each*** that *a man who says that there is a* ***plurality*** *is stating something contradictory"*—all of Zeno's paradoxes can be subsumed under one single mathematical model emulating or distilling the form of his general paradox of plurality

[i*] See, The Two-Floors of the Transfinite (p445).

[ii¥] (Verelst, Zeno's Paradoxes. A Cardinal Problem: I. On Zenonian Plurality)

(PP). And this model underlying even the paradoxes of motion (PM) (stadium included) consists of a simultaneous "through and through" infinite division. This is essentially our immanent/transcendent omni-axis of infinite omni-local division. Indeed, Verelst demonstrates through linguistic analyses from the original Zenonian Greek that Zeno nowhere invokes time for this divisional procedure. Just as our immanent/transcendent omni-axis exists in the second-order eternal NOW of conceptual pure relation, so too does Zeno's infinite "through and through" division also exist *sub specie aeternitatis*. And in the paradoxes of motion, the underlying simultaneous "through and through" division is simply encountered and made manifest, demonstrating the "infinite division equals indivisibility" of motion *through* infinitely divided and thus indivisible extension. It is for this reason, argues Verelst, that Aristotle's distinction between potential and actual infinity is untrue to Zeno's premises and thus fails to refute him, as modern mathemagicians, stage-hands and participating audience members all seem to agree.

The basic Zenonian PP argument can be found in many forms. For example, Sorenson gives a common exoteric account, following along with the problematic and con-fused received view of the Parmenidean legacy [my comments and ***emphases***]:

> Some of Zeno's arguments bolster Parmenides' [purported] rejection of anything having size. If an object has a size, then it has parts [e.g. left and right sides]. This collective is actually a conglomeration of things rather than a single thing. Therefore, the only ***genuine individuals*** must have no size. But if an object has no size, then it is nothing at all. Go ahead, add a sizeless object to another object. There is no increase in size. If thousands of sizeless objects were put together, they would still not add up to anything. Since sizeless things do not differ from nothing, they are nothing.

Notice here the implicit assumption that thingness necessarily equates to individuality. The argument here—presented in exoteric form—is not ultimately against *things* having size, but only against "*genuine individuals"* or *indivisibles* (i.e. *a-tomoi* and absolutized finite unities) having size—and therefore, ultimately merely *for* the idea of the infinite ALL-ONE. The category of "thing" employed by the exoteric caricature of Sorenson's Zeno implicitly includes and hides the category of absolute individuality. Zeno is not merely arguing against the existence of things, but against *absolute things*, like *a-tomoi*. If we "pulverize" the category of "thing" upon the exoteric ambiguity hidden within it, we can divide it into two categories: individuals and dividuals (e.g. *a-tomoi* and holons). Zeno's argument merely demonstrates, and purposefully so, the impossibility of the absolute *individual* (*a-tom*), with respect to the concept of size, and thus indirectly *for* the implicit holonic logic of sets, with its implicit unity in the ONE-ALL.

Zeno, recall, was arguing for the infinite and eternal Parmenidean Being-now, but *only at the absolute scope*. At the relative scope, things can come and go. Zeno and Parmenides merely state that *ultimately* they are ONE.

This hidden argument is very similar to the much more transparent Buddhist argument against the Eastern equivalent of the *a-tomoi*. If atoms have any size whatsoever they will have a boundary and thus they can be placed next to each other. When placed together there will be one *part* of each a-tom that is closer to, or even touching the other. Therefore atoms—and things of any size whatsoever—are necessarily composed of parts (as indeed science has shown, where it can). Only infinitely small points can be free from a boundary and thus free from proximally relational parts. But in this freedom they are also free from existence. They are mere abstractions of location—aspect infinities and implicit singularities—with no extension and no "substance." Recall again our encounter with these points through the Principle of Absolute Reversal. This occurred, recall, in the absolutization of thingness and individuality in modern physics. And this ended with the reduction of "ultimate particles" to mere points, resulting in the "Inverse Unified Field"—the ONE-ALL of negation with its nonexistent "infinitely small" points nonexistently flitting about the nonexistence-incarnate contradiction of the boundless void.[i]*

Without the recognition and admission of the category of Parmenidean "thingness" itself as implicitly enfolding the category of indivisibility (i.e. that they are talking about first principles and thus the absolute scope), Parmenides and Zeno can *appear* to be arguing against mere "thingness" itself, and thus against the natural and common-sense correlative of the infinite Heraclitean multiplicity of the ALL. Through their correct arguments against bounded indivisibles—absolute finite unities—they would seem to be arguing against relative difference itself—exoterically couched as their arguments commonly are against mere "things," such as we find in Sorenson's rendition. This is why their paradoxes *seem* on the surface to contradict everyday experience, yet ultimately, in the proper nondual context, they merely reach the founding principle of esoteric and originary rationalism—not a problematic paradox, but a necessary identity of opposites; a Heraclitean and Parmenidean polarity where infinite division equals indivisibility, and vice versa.

A more telling argument can be found in the original source of Simplicius' account of the "second Paradox of Plurality," and recall again that Simplicius himself was quoting and paraphrasing from his own copy of Zeno's book on paradoxes. And recall also that he was a student of Zeno, not attempting a refutation of his own, as was Aristotle. It is for this reason, naturally, that all

[i]* See, Chord 3 Example: The Inverse Unified Field, p117.

of Aristotle's antagonistic accounts and renditions of Zeno's paradoxes are themselves suspect. If you are attempting to refute a paradox it is all too convenient, when not quoting the original source, to render it in such a way as to make the "refutation" more effective and possible. Simplicius writes [my ***emphasis***]:

> For in his proof that, if there is plurality, ***the same things are both finite and infinite***, Zeno writes the following words: "if they are many, they by necessity are as many as they are, not more nor less. But if they are as many as they are, they will be finite [bounded, *peperasmena*]. But if they are many, they will be infinite [unbounded, *apeiron*]. For there will ***always be*** others in between of the beings, and there again others in between."

Note that this is known as "the argument from denseness," and in mathematics "density" denotes infinitely detailed or divided. Verelst writes that the contradiction is that "if 'they are many, they will be both bounded and unbounded'." In other words, Zeno, ahead of Cantor, demonstrates the infinite number, and ahead of Spinoza, the bounded infinite.

Indeed, from these analyses, Verelst, following W. E. Abraham, deduces from Zeno's own thought experiment the "Zenonian principle of the **equivalence of the parts and the whole**," and we can see plainly the equivalence of this Zenonian principle with the modern definition of infinity itself. Again, it is clear that far from a refutation of Zeno, Cantor actually presents the mathematical culmination and validation of Zeno's Parmenidean program. Verelst continues:

> The point is clearly somewhere in the sentence: *For there **will always be** others in between of the beings, and there again others in between*. Even if not mentioned explicitly, this cannot be other than some kind of divisional procedure, exactly as we conceive of fractions to mentally break a line. ... It inevitably follows that Zeno had in mind a division which is both symmetrical and nondirected, i.e. one in which *all* parts undergo the *same* divisional process.

Zeno's own words, "*For* **there will always be** *others in between of the beings…*," specifically denotes an *a priori* and instantaneous division—an infinite division merely *encountered*, not generated through the processes of time and motion. This is the simultaneous division "through and through," underlying any notion of time and motion in all of Zeno's paradoxes, which Verelst demonstrates mathematically as equivalent to Cantor's uncountable infinite, unreachable by time-ordered stepwise processes, such as a supertasks.

Aside: Countable and Uncountable, Linear vs. Parallel and the "Hard Problem" of Consciousness

This, then, seems to point to the intrinsic difference between algorithmic description or emulation and real-world complexity, invoking our resonant chord in the Principle of Infinite Determinism: "infinite determinism equals indeterminism." Algorithmic description is merely stepwise and thus cannot reach and encapsulate the full continuum, whereas real-world simultaneous "through and through" depth can access or emerge from the full uncountable infinity of the continuum. This notion, then, would seem to have vast reaching impacts in much of theoretical science and philosophy, for example in the philosophy of mind or artificial intelligence. Given that algorithmic or stepwise complexity can only be countably infinite, there will always be something missing from any algorithmic emulation of real, massively-parallel reality. This then shows the truth behind the intuitions of the armies of philosophers-of-mind who sense that no algorithm can encapsulate or fully generate and emulate human consciousness. The solution to the hard problem of consciousness, then, may be a function the resolution to Zeno's paradoxes.

Zenonian Plurality and the Binary Interface of the VL-Axes

Verelst demonstrates this even more effectively through the "first Paradox of plurality." She summarizes the argument thus:

> Zeno says that a) infinite division leads to an infinite number of final, indivisible parts which still do have a magnitude, because, b) if they would not have magnitude, they would not be at all, and so the object of which they are part would not be at all. And an infinite number of parts possessing, however small, finite magnitude, would give us an object infinitely big. But c) given that the division is complete ('throughout'), no parts with finite magnitude can remain, therefore d) the object constituted by them will be infinitely small. Thus, upon Zeno's argument, a finite thing consisting of a plurality would be either infinitely large or infinitely small. The subtle variant of the standard interpretation thus offers us Zeno's argument as a dilemma.

In other words, by taking finite division to the absolute scope it reflects (via dilemma) into the two poles of the Immanent/Transcendent axis; the "infinitely small" and the "infinitely large." Verelst continues [my **emphases**]:

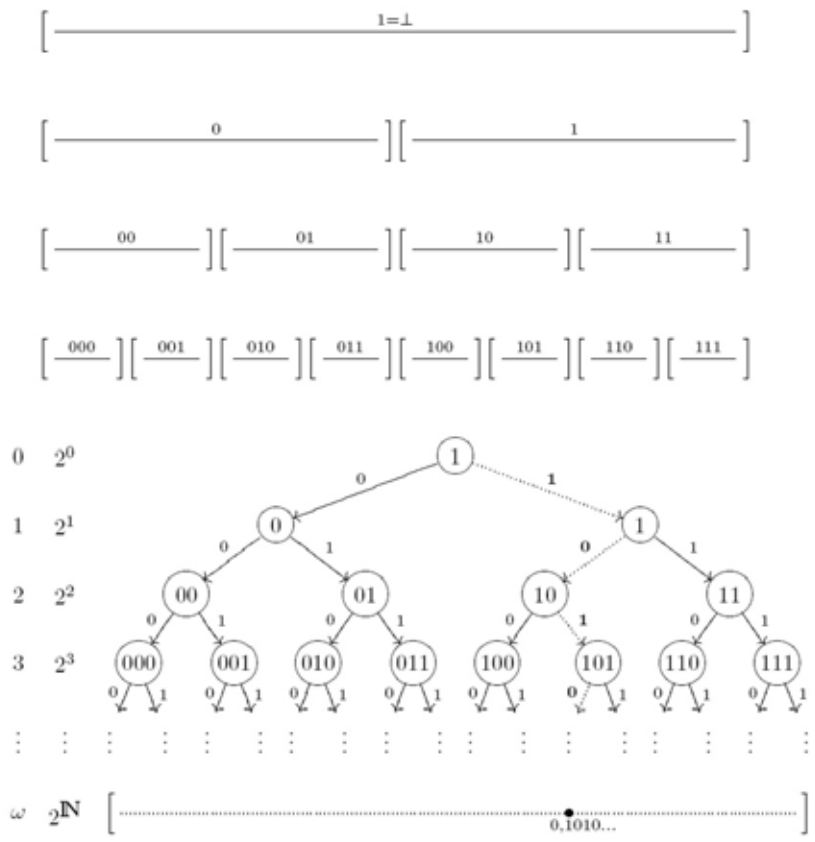
> The central point thus is that by being simultaneous (i.e., by occurring in no lapse of time) the completion by division is at once, cardinal, not

> stepwise, ordinal. This refers to the arithmetic of "infinity", developed towards the end of the nineteenth century by G. Cantor, who proved that different kinds of infinity exist which he called *cardinal* and *ordinal* infinity. Cardinality ("Zahl") expresses the total number of elements of a given set; ordinality ("Anzahl") concerns the way these elements can be ordered stepwise. … The infinity of the continuum is *uncountable*.
>
> … **Zeno's procedure *at once* generates the *uncountable* cardinality of the continuum instead of the merely *countable* one which would be attainable when one interprets Zeno's procedure *stepwise*.** …
>
> But this does not yet suffice to completely solve the riddle, because it leaves untouched a related problem … : how to construct an extended object out of parts with no extension whatsoever? Zeno cannot just intend that his division generates the unextended points composing the continuous line, for then only the 'being nothing'-part of his paradox would remain. **Zeno's divisional procedure generates an infinity of partitions and a *different* infinity of parts at once and jointly *in any part independent of its length*.** The simultaneous and uninterrupted [*apeiron*] repetition of partitions is clearly stated by Zeno himself: *to say this once is as good as saying it forever [aei]*.

Indeed, Verelst carries out this thought experiment mathematically, rigorously demonstrating the veracity of Zeno's logic. After a detailed and rigorous mathematical demonstration, following with an explication in the formal language of domain theory, she says:

> We thus obtain the two kinds of infinity constituting a finite body: an infinity of extended parts … which would generate when left on its own an infinitely large body. And an infinity of unextended parts - points - which, when left on its own, would generate a body with no extension at all. … Conclusion: Zeno's divisional procedure can be represented by a binary tree, a Zenonian semi-lattice in which the nodes represent the *megala*, while the *micra* are given by its paths, in two different infinities, as follows: [[See Figure 62, below]]

These "two kinds of infinity," naturally correspond to the interface, in Zeno, between the two fundamental VL-axes of mathematics itself, corresponding as well (in any stepwise instantiation) to Cantor's countable and uncountable infinities, as we have seen. These are, respectively, our transitive and I/T axes. The infinity formed of extended parts—the *megala* or parts, and represented by the nodes—corresponds to the transitive axis. And the infinity of the unextended parts—the *micra* or partitions, represented by the paths—corresponds to the immanent pole of the I/T omni-axis. Note as well how the transitive nodes generate the transcendent infinite, confirming yet again the repeated coincidence and mapping of transcendence via transitivity, as in our trans-bias.



The measuring rod $M\ \{0,1\}^{\mathbf{N}}$, the *Philebian set* $\mathbb{P}$.

For in two ways it can be said that a distance or a period or any other continuum is infinite [apeiron], viz., with respect to the partitions or with respect to the projecting parts [Aristotle, Phys. Z, 2, 263a (24-26)].

For whoever divides the continuum into two halves thereby confers a double function on the point of division, for he makes it both a beginning and an end [Phys. Θ 8, 263a (23-25)].

Figure 62: Verelst's Zenonian Binary Tree and Semi-Lattice:
Copied from (Verelst, Zeno's Paradoxes. A Cardinal Problem: I. On Zenonian Plurality)

The Paradoxes of Motion and the Many Faces of Plurality

We have no first hand account of Zeno's paradoxes of motion, rather they are rendered for us by Aristotle, who was simultaneously attempting to refute them. (For some reason Aristotle did not attempt a refutation of the underlying and critical PP. Perhaps the PM were easier, given that through them Aristotle could inject non-Zenonian time, to make his distinction between potential and actual infinity.) Verelst writes:

> Zeno's famous Paradoxes of Motion are transmitted to us by Aristotle [*Phys.*, Z 9, 239b], with the comment that they are notoriously difficult to refute. And indeed attempts to either refute, [or] resolve them have been at the order of the day up to the present: *no one has ever touched Zeno without refuting him, and every century thinks it worthwhile to refute him*. Let it suffice to say that, however relevant in themselves for future developments in, say, mathematics, ***all* presumed refutations hinge on non-Zenonian premises, so that, whatever it was that was refuted, it was certainly not Zeno**.

As stated previously, Verelst demonstrates that all of Zeno's paradoxes of motion (PM)—including even the stadium paradox—can be subsumed under the timeless and instantaneous form of the general paradox of plurality (PP), rendered into mathematical rigor, above, and explained in her paper in the formal language of domain theory. Verelst writes [my **emphasis**]:

> It would moreover be quite strange that Zeno, in order to defend Parmenides' stance with respect to the deictical unreality of time [i.e. time as *illusory* with respect to the absolute of the Being-now], would introduce it to make his point. …
>
> … Our analysis of PP thus should be applicable to PM as well. The reason invariably is that **"to move" implies "to count the uncountable"** …

In other words, the tables have turned on Aristotle. It is the uncountable infinite of the ignored PP which already exists as the actual infinite underlying all of the PM. And further, it is divisible movement that takes on the time-ordered, stepwise function of the potentially infinite, never able to reach the immanent pole of the actually existing omni-axis within which motion acts.

> Bell puts it like this: *Continuity and discreteness are united in the process of measurement in which the continuous is expressed in terms of separate units, that is numbers.* …

This modern view, incidentally, is similar to Leibniz's analysis of the continuum from the viewpoint of Spinoza's earlier and quite prescient Triune Infinite, where points and boundaries are merely abstracted out as aspects (termini or folds) of The Infinite. And in Interface Mathematics, recall, it is the immanence of the continuum that is prior to the first unit itself in the Cycle of Unity. Verelst continues [my **emphasis**]…

> This is the fundamental point one looses out of sight when one throws actual infinity out. One assumption implicitly underlying the execution of Zeno's procedure—we touched it already before, but here it becomes particularly relevant—is **the onedimensional, horizontal orientation of the divisional process. This assumption allows Zeno to go over without any further ado from plurality at rest to plurality in motion. When one reads the PM-fragments from this angle, the astonishing coherence of the arguments immediately hits the eye.**

From this angle one sees that all of paradoxes of motion (PM) are merely implications of the general underlying PP structure—the infinite division and plurality underlying change or motion. Motion, then, merely brings out, or makes explicit the paradoxical aspects of plurality already demonstrated in the PP arguments.

Verelst says, "Zeno's point precisely is to show that, *however small the distance*, the number of parts to cross will remain the same," and this again illustrates the Zenonian Principle presaging our modern definition of the infinite as equal to its subsets. It also foreshadows Cantor's findings that any segment of the continuum, no matter the size, will have the same cardinality as any other or as the whole. Verelst continues [my comments]:

> Time, being related to distance, is irrelevant in exactly the same way as the length of our measuring rod was irrelevant. … 'To count the uncountable' is thus the motion-face of the plurality-coin, which, as the reader will remember, can be summed up in the slogan 'to consist out of parts with and without magnitude'. One sees that Aristotle's choice, far from being arbitrary, was to pick out exactly those renderings (from an undoubtedly larger corpus [purportedly some 40 odd paradoxes]) that develop the paradox step by step, in order to lay bare its many faces, and to bring out why it is so difficult to resolve. But although the Stagirite realised the nature of the underlying problem, he apparently did not believe that Zeno himself did. This—together with the fact that we know Aristotle's analysis only from lecture notes taken by his students—explains methinks their somewhat muddled-up phrasing and sometimes cumbersome argumentative development.

Verelst then organizes the paradoxes of motion—as received via Aristotle and now fully subsumed as the many faces of the PP—according to increasing perplexity.

The Dichotomy: "Motion Cannot Take a Start"

According to Verelst, the Dichotomy or Runner Paradox is the simplest or least perplexing of the bunch. Aristotle gives us the Received View of the argument as follows [from Verelst, with my [[comments]] and **emphases**]:

> The **first** [argument] is the one which **declares movement to be impossible** [[or simply contradictory and ultimately polar and nondual]] because, however near the mobile is to any given point, it will always have to cover the half, and then the half of that, end so without end before it gets to the goal. (...) Hence Zeno's argument makes a false assumption in asserting that it is impossible to pass over an infinity or to touch one by one infinitely many in a finite time. **For there are two senses in which length and time and the continuum in general are said to be unbounded: with respect to partition and with respect to the extended parts.** Therefore it cannot be assumed possible to touch an infinite quantity of things [i.e., parts] in a finite time, though this can be assumed for partition, because time itself is infinite in the same way.

The Received View then, is that this paradox demonstrates that "motion cannot take a start," but in reality Zeno was demonstrating merely that *if* we conceive of motion as ultimately consisting of a stepwise plurality of infinitely divisible parts, *then* motion is impossible—stepwise and merely countable infinity can't account for the instantaneous uncountable continuity of Zenonian plurality underlying that motion.

Again, the tables have turned on Aristotle. If we take the rather commonsensical view that motion is *not* made of parts, however, then we are simply siding with Zeno and Parmenides and they (or we) have won. Motion is *ultimately* indivisible: one eternal Being-now. In Nondual Rationalism, however, we know that they are *ultimately* the same, because when infinite division is conceived "through and through" outside of time it is of the order of the mathematical continuum, and then "infinite division equals indivisibility."

Verelst notes that Aristotle cleverly injected the notion of time into Zenonian plurality with the phrase, "Hence Zeno's argument makes a false assumption in asserting that it is impossible to pass over an infinity or to touch one by one infinitely many **in a finite time**." Verelst says that Zeno never mentions time. And it is with the introduction of non-Zenonian time here that Aristotle generates his false refutation based on potential vs. actual infinity.

The Achilles: "Motion Cannot Come to its End"

The next paradox in ascending order of perplexity, according to Verelst, is the Achilles. Aristotle explains it thus:

> The **second** [argument] is the so-called Achilles. This is that the slowest runner will never be overtaken by the swiftest, since the pursuer must first reach the point from which the pursued started, and so the slower must always be ahead. This argument is essentially the same as that depending on dichotomy, but differs from it in that the added lengths are not divided into halves.

Aristotle precisely notes that this argument is essentially the same as the Dichotomy. However, "The case is slightly more complicated," Verelst notes, "by the fact that both the moving body and the goal to attain are themselves in motion, but the complication is not substantial, as Aristotle points out himself: *it merely implies that the distances to cross will not decrease symmetrically*." Verelst continues:

> The received view presents us Zeno's argumentation as flawed by an elementary mathematical error, due to a lack of mathematical sophistication. In accordance with Aristotle's distorted rendering of Zeno's argument, it is presented as a potentially infinite sequence decreasing geometrically… the sum of which can very well have a finite total, because the underlying sequence converges to its finite Cauchy-limit.

Verelst continues to show that this view has already been challenged by Vlastos, who, "given his direct acquaintance with the sources of ancient Greek thought" was "at unease" with this modern interpretation. He then finds another interpretation that requires a *countably* infinite number of steps, a "supertask," which is generally considered possible in certain circumstances. Because a supertask is a time-ordered procedure, however, it is essentially Aristotle's potential infinite argument in another guise and with a possible refutation. The false assumption on both of these accounts is that Zeno's infinite division is stepwise and thus countable, and thus the purported resolution via supertask is also a non-starter. Verelst continues:

> But although we ever only make finitely many steps, even if we could make countably many, the stretches to cross would be uncountable in number. Thus a Zenonian supertask properly speaking would require an infinity of acts in no time!

The Stadium: "The First Two Arguments Combined for Extended Bodies"

"This argument," says Verelst, "traditionally known as the fourth argument logically is the third, because it simply combines the former two. What happens when two measuring rods … pass each other at constant velocity in opposite directions? So we now not only consider the relation rest/motion, but motion/motion as well." To me it is the least compelling of the bunch because its underlying truths can so readily and easily be con-fused, but we'll include it here for reasons of completeness.

Sorenson gives a simple, and traditionally distorted account of the Stadium Paradox as follows:

> The final paradox of motion concerns opposite movement of objects in front of fixed observers in a stadium…[See Figure 63, below].

Figure 63: Zeno's Stadium Paradox:
Adapted from fig. 4.4 in Sorenson's *A Brief History of the Paradox*.

> Let AAAA represent the fans. Let BBBB and CCCC Represent two complex bodies that move in opposite directions at equal speed until they are aligned with the fans. Is this convergence possible? After moving, the first B has moved past two As. Yet the first C has passed *four* Bs. Therefore, the first C has moved twice as fast as the first B. This contradicts the opening assumption that the blocks were moving at equal speeds.

ARISTOTLE'S SOLUTION

> I remember having trouble understanding the stadium paradox. Doesn't Zeno realize that velocity is relative? BBBB and CCCC are moving equally fast with respect to AAAA but are moving twice as fast with respect to each other. Aristotle's solution to the "paradox" simply draws the distinction we find so obvious. I thought this was uncharitable to Zeno; could such a brilliant philosopher be guilty of so obvious an equivocation?

Given that ultimately the same paradox of plurality underlies this paradox as well, as usual, things are not as simple as they might seem. First of all, the exoteric Received View doesn't mention at all the infinite division "through and through" of the PP underlying this paradox. It simply mentions a doubling of speed, which is time/distance. Sorenson's rendition is then another example of Zeno's simultaneous through and through division not only ignored, but also injected with the non-Zenonian premise of time. Secondly, repeating Verelst from before, "Time, being related to distance, is irrelevant in exactly the same way as the length of our measuring rod was irrelevant." The uncountable infinite Zenonian plurality of each passing body exists prior to the stepwise and merely countable act of mutual measurement. "'To count the uncountable' is thus the motion-face of the plurality-coin," says Verelst. She continues [my **emphases**]:

> The Received View here is that Zeno did not understand the (Galilean) relativity governing the motions of bodies in inertially moving frames of

> reference, as in the case of two cars crossing each other with equal speed on a high way: *The unanimous verdict on Zeno is that he was hopelessly confused about relative velocity in this paradox*. But in Zeno's description, every part at every moment faces its doubling by division, whether it be in comparison to a stable measuring rod, or a rod passing by. **The problem arises from the fact that, because of simultaneous through-and-through division, "to double" here involves a transition from ordinal to cardinal, from countable to uncountable, from potential to actual infinity.** The infamous "doubling of the times" only takes into account the potential, stepwise part of the argument. For of course, every body, while being a continuum, "touches" (counts) the other one everywhere when it passes (measures). **It remains just the same cardinal problem.** Their speed proportional to each other does not change anything to this fact, analogous to what we saw with the Achilles: they are at every moment passing each other at infinitely many parts, which, by facing each other's unlimited division, count each other's uncountability.

Thus, Verelst demonstrates, even Zeno's Stadium paradox has not been refuted, given the same paradox of plurality underlying it which even Aristotle did not attempt to refute. Verelst reminds us, however, "**Let us stress once more that Zeno does not imply that motion does not exist, only that it is paradoxical.**"

The Naked Paradox (The Arrow): "Motion is Self-Contradictory"

The Arrow paradox is traditionally known as the most perplexing of them all because, writes Verelst, "the only thing that remains is the naked paradox." Verelst gives Aristotle's account of the paradox as follows [my ***emphases***]:

> The **Third** is that just given above, that the flying arrow is at rest. This conclusion follows from the assumption that **time is composed of instants**; for if this is not granted **the conclusion cannot be inferred**.

We find a more detailed account in Sorenson, however:

> The third paradox asks whether a moving arrow is at rest. An arrow is at rest if it is in a place equal to itself. At any given moment, even a very speedy arrow cannot be where it is not. Therefore, it must be where it is, and so in a place equal to itself. So a flying arrow cannot move.

This paradox, says Verelst, "radicalizes the reasoning by combining the first two arguments pointwise, so that the contradiction plainly arises." In "refuting" this "naked paradox," and because "it does not leave any room for anything timelike to be smuggled in," says Verelst, Aristotle has to resort to the premise of the "parallelism of divisibility of space and time." This parallelism states essentially that Zeno forgot to take into account the division of the time it would take to make the transit, and thus each division

of space would proceed correspondingly faster and faster with its corresponding division of time, such that upon reaching the unreachable infinite, the transit time itself would be infinite. Sum it all up and you get the unity of the space-time transit itself, merely divided in concept into an infinity of parts. In this operation, however, Aristotle introduces into Zenonian plurality "as an explicit assumption" what he calls 'time-atoms,' which are indivisible instants of which the path of the arrow must stepwise be composed. These time atoms are essentially transitive zeros, which we already know are unreachable and merely fictitious negations, not immanent infinities. Aristotle claims that Zeno's argument is based on the "assumption that **time is composed of instants**," otherwise, he says, "the conclusion cannot be inferred." And to this Verelst responds, "after you have discarded actual infinity, that is." She continues:

> He then rejects these time-atoms, and proposes his potential divisibility as a more apt solution [Phys., Z 9, 239a(20-24)]. But of course chronons, like atoms, are non-Zenonian. **This is another nice example of Aristotle's general neutralizing strategy with respect to Zeno's paradoxes: to introduce a seemingly self-evident hypothesis on Zeno's behalf, such that his own principle of contradiction can subsequently be applied successfully.**

Again we see the distorting oppositional forces of representation in the dualistic and early phases of rationality. Verelst continues, illustrating concisely the interface between our two fundamental VL-axes as they manifest in Zeno's two infinities, the *mikra* and *megala*, roughly the immanent pole of the I/T axis (partitions or paths) and an infinitely decreasing holarchy of extended transitive segments (parts or nodes) [my comments].

> When parts considered are of the *megala* type, one can still be impressed by seeing the motion that takes place. [This is because megala, as finite unities, have boundaries between which the arrow can fly.] When looked at from the point of view of the *mikra* the paradox becomes inescapable, for one cannot see motion over an unextended "distance" in the unextended now. These parts in effect cannot be further divided, which is why the atomistic point of view seems to fit in naturally [yet unnaturally, given that they collapse into naught]. But one then forgets an essential thing: the arrow is a finite object consisting of megala *and* mikra, which nevertheless flies.

The mathematics of the modern continuum has indeed vindicated Zeno. The continuum is *not*, as indeed Zeno is precisely saying, composed of instants. That is the essence of the Parmenidean point of view. The ALL of "what is"—Being itself—is ONE, not many. Indeed, Aristotle's "time-atom" is not merely just a *non*-Zenonian premise, but an *anti*-Zenonian premise. It is undeniably quite telling that Aristotle can only refute Zeno by turning him into his opposite—an atomist. An unintended *self-reductio* of sorts, on his own part. Verelst continues:

> The last two arguments show that, whether we consider the *megala* or the *mikra*, the paradox remains the same. This is where the reading of the last two arguments as a dilemma stems from.

Thus we see that the perception of "paradox" itself is a con-fusing function—a conflation of the prefused distinction—of the hidden polar and triune interface *between* these two VL-axes and thus between the countable stepwise transitive infinity and the uncountable infinity of instantaneous immanence and transcendence, not merely a result of one or the other. Verelst continues:

> But once the true nature of Zeno's paradoxes is assimilated, this last argument reveals itself as the contrary of how it is generally perceived: a clear an incontestable exposure of the paradoxical nature of motion and change, and not an incomprehensible enigma.

In other words, Zeno's thought experiment does not show that motion does not exist, but merely (exactly as Simplicius indicates) that motion is *contra-dictory*, or that it contains a con-fusing polarity which emerges when one tries to *speak* and reason about it.

> If you let motion, conceived of as covering all systematically smaller extended parts of a line by counting the uncountable in every single part, come to an end by mentally letting the extension of the parts decrease to nought, then division 'comes to an end' too, and the only thing that remains is the naked paradox. This explains why this paradox in the literature has been considered as the most enigmatic one, while it actually only sums up Zeno's conclusion in a concise way.

Tuning and Triuning the Naked Zenonian Interface

Contrary to the Received View, the naked Zenonian paradox dissolves readily away when conceived *not* simply as a contradiction but as *an actual polarity* of diction—a triune interface between two boundless axes underlying conceptual relation itself, along with all its derivative conceptual protocols of description and diction. All of these paradoxes, we have seen, involve the interface between the quantized transitive and the unbounded immanent/transcendent, and its "infinite division equals indivisibility" of continuity. Thus they deal exclusively with the immanence of the Bounded or third order infinity in Spinoza's Triune Infinite, which itself is a reactionary function against the transcendent-bias. As we have seen throughout mathematics and conceptual embryogenesis itself, immanence breaks the trans-bias to effect a transcendence into new operations and identities. Likewise, Zeno's naked paradox radicalizes immanence to break the transcendent bias of dualistic representation—i.e. diction—shocking us, generation after generation into various and sundry attempts to refute him. And all the while, in this very interface—in this refutational dance with Zeno

himself—we move closer and closer to operationalizing and vindicating the polarity and truth hiding at the naked core of his ubiquitous paradox.

The hidden anti-Zenonian premise at the heart of the naked paradox is that which resides at the heart of the labyrinth of the continuum: continuity is *composed* of parts. This is what Zeno time after time refutes. We have already seen[i]* that Leibniz found his Ariadne's thread in his secret Spinoza studies on the Triune Infinite. His conclusion, recall, was precisely Zeno's: points *do not* compose the continuum. But with Spinoza's Triune Infinite he went further, tuning and triuning the Zenonian paradox. Not only do points *not* compose the uncountable continuum, but they are merely *abstracted from it* as unbounded and unreachable "termini"—what we herein reference with the various names of: "implicit singularities," "location aspects," Deleuzian/Leibnizian "folds," or "immanent infinities." The modern mathematics and "transfinite arithmetic" of the infinite and the continuum (transcendence and immanence, respectively) has vindicated both Zeno and Leibniz, and through them Parmenides, Heraclitus and Spinoza. The infinitely divisible continuum is indeed the indivisible *immanent aspect* of the instantaneous and uncountable immanent/transcendent omni-axis. And any infinitely-infinite Heraclitean multiplicity of contrasting positional aspects can be *abstracted from* its Parmenidean Being-now Unity—be it for the sake of unbounded increases in calculational precision for its indivisible trajectories, or simply for a philosophical thought experiment demonstrating its own intrinsic conflated and con-fused polarities.

Thus the naked paradox dissolves, as every child knows it must. Zeno's immovable plurality of instants is merely a con-fused abstraction. An unreachable *aspect* of immanence abstracted from Parmenides' own Being now. Parmenides and the child have won—and thanks to the countless man-hours of the myriad regiments of mathematicians, scientists, philosophers and artists, inspired by Zeno himself into working out the details of this con-fusion—tuning and triuning the Zenonian interface itself—we can now say exactly *why*.

Further Cultivating the Zenonian Third

As we saw with our geometrical example of the paradox,[ii]* it is only by pulverizing the transcendent-bias and LOMA[iii] of a system of categorical dualities, into the acategorical immanence of a new system, that the polarity underlying the paradox can be tuned and triuned into a conceptual nondual realization. We have already seen the general framework of the nondual

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[i]* See, The Spinozan Catalyst in the Triune Infinite, p407.

[ii]* See, Paradox and the LOMA: A Geometrical Example, p435.

[iii] "limits of minimum (semantic) ambiguity" — Lebau

categories in action in our Nondual Rationalism and Interface philosophy, as outlined most concisely, perhaps, directly above. The details of this interface can be cultivated further, however, as we will see, by interfacing the interface itself with the many faces of the Zenonian plurality as it works its way through its ramifications with the concept of motion.

The interface of VL-axes, we have seen, underlies the very form of Zenonian plurality, which itself underlies all of the paradoxes of motion. In the Bisection paradox, for example, the interface occurs directly in the symmetrical infinite division of transitive motion as it expresses its own intrinsic Zenonian plurality. Whereas in the Achilles paradox the interface is hidden in the ever dwindling yet countably unreachable asymmetrical difference in time needed to parse the implicit and instantaneous uncountable continuity of the transitive and finite, yet ever irrelevant distance between Achilles and the tortoise. In the Arrow paradox, the infinite division of the motion of the arrow has already occurred and the interface is naked and self-evident in the pre-given singularity of the instantaneous point-aspect in space-time.

The con-fusion in all these cases, more precisely, is in the collapse or false equality between transitive and immanent zero, and thus between countable and uncountable infinity as it manifests into various conceptual segments of the continuum. Immanent zero is an implicit singularity. It cannot be reached because reaching is a transitive stepwise function on this infinite immanent/transcendent uni-axis. Furthermore, according to our Principle of Nondual Rationalism and the Principle of Absolute Reversal, infinite division equals indivisibility or continuity. It is actually the infinite divisibility of time and space that necessitates that the zero-limit is only fictitiously reachable by any stepwise process of division, such as that in the calculus. And taking division to the uncountable absolute scope merely ends up at the continuity one started with—the one continuous journey itself. Thus with this move, as noted previously, we merely side with Zeno and Parmenides.

The continuum, Leibniz concluded, is not formed from points. Rather, "termini" are abstracted out of it as unbounded immanent aspects of The Infinite. If space-time points are merely *abstracted* out of the eternal NOW of The Infinite, then, the trajectories of the arrow, Achilles and the tortoise are not *composed* of zero-points. These "limits at zero" are simply transitive illusions of perspective between two frames of reference based on the two fundamental binary axes of pure-relational (mathematical) and categorical/conceptual thought. Immanent zero can only be "reached," by Zeno or anyone, through abstracting its implicit infinity out of the timeless concept of The Infinite itself.

Gerald Lebau came to essentially the same conclusion of a confusion between frames of reference, but informed by the context of modern

relativistic physics, as well as the con-fused Received View on Zeno [my comments and **emphases**]].[i¥]

> Zeno's arguments were based on formal logic, not experience, which helped give them a timeless power.
> …
> Zeno [according to Aristotle, and contrary to Simplicius] asserted that at any instant there is no motion. His assertion was correct for any zero point in time—but **time is not a series of zero points** [which is exactly Zeno's Being-now point]. Time is an organic emergent of being which is defined by its durational becoming. Literally, there is no absolute point in time [again, Zeno's point].
>
> From the perspective of the arrow toward itself, it is always at rest. From the perspective of any observer who is in a different inertial frame of reference, the arrow is in motion.
>
> Motion of oneself can only be observed when one steps out of one's own frame of reference. Therefore, the bottom line is that a flying arrow is both at rest and in motion "**at the same time**". [This is an abstraction of the naked paradox itself—i.e. the triune interface—between transitive time and the immanent/transcendent second-order eternal-NOW of all times.] The trick here is that time is relative to a given frame of reference, so that the same arrow simultaneously lives in a near [or uncountable] infinity of possible frames of time references.
>
> Zeno was right in observing that at any time there is no motion within each inertial frame of reference. His mistake was in not separating different inertial frames of reference, a relatively simple procedure. Thus is Zeno's paradox resolved. [This is perhaps a fair *resolution* to the con-fusion of the paradox, yet not a *refutation*, given that Zeno was not denying motion or experiential time itself, just the assumption that it was composed of a plurality of zero-points or instants.]
>
> Let us now imagine that the arrow is closely flying from one side to the other of the visual field. Despite this special observer's confusion, the arrow "feels itself" to still be in the eternal present, and at rest—because the arrow "experiences itself" as a whole, rather than as a collection of parts or linear segments, or even molecules and atoms.
>
> What the arrow essentially "experiences," the existential human existentially experiences. ... so too we cannot stop and start an arrow, or a space ship accelerating through the void. Motion and change are integral aspects of being; but specific times are fictions we humans impose on the flow for our understanding and convenience. [A well said conclusion for the Unity of the Parmenidean Being-now. Aside from this, we give Lebau the last Zenonian word.]

[i¥] (G. Lebau)

PARADOXICAL POSTSCRIPT AND EPITAPH: KAN'T AND THE ANTINOMIES OF PURE REASON

Originally, I was planning on devoting an large section to Kant's "antinomies of pure reason," but things have changed dramatically with the recent Zenonian turn. My plans for Zeno did a complete 180, given that my original intention was to show, through Interface Philosophy that Zeno's paradoxes were errors of reasoning on his part. Indeed, much of what was already written *against* Zeno, was simply turned around against those who misunderstood him. A case in point is the Aristotelian distinction between actual and potential infinity. It was Zeno who was standing on the ground of the actual and uncountable infinity and Aristotle et al who failed to reach him through the actualized stepwise and merely countable potential infinite. Indeed, I had originally come to the same Aristotelian "refutation" via the parallelism of time and space, only to first recognize that it was unoriginal and then that it was simply non-Zenonian and not a refutation or resolution at all.

To my great surprise, however, the tables were also turned on me. Zeno's paradoxes, in the end, far from being refuted, merely demonstrated and radically bolstered the Interface model itself, rigorously demonstrating the fundamentality of its own VL-axes, for example, and as we have just seen. And through the Zenonian turn, the historical trajectory of Nondual Rationalism found its Western roots, as the EOTC itself was shown to echo, again and again throughout the history of Western philosophy, as it works itself out, transitively and transcendentally, toward the immanence in transcendence of its abandoned, neglected and confused nondual roots.

Given that both Zeno's and Galileo's paradoxes have been tuned and triuned by the modern mathematical continuum and Cantorian transfinite arithmetic, and into philosophy and common-sense with the understanding of Interface Philosophy and Nondual Rationalism, it is more than obvious that, contrary to Kan't, the human mind can indeed reason about the infinite, in whatever form it happens to take. Kant's claim was that human reason had reached its limits with the concept of infinity as applied cosmologically or cosmogonically to spatial or temporal aspects. For example, when attempting to reason about the "beginnings" or extent of the universe. With the culmination of Interface mathematics in our section on Zeno, however, with his vindication and codification into the truths of the mathematical

continuum and the Cantorian transfinite arithmetic, it is nearly sufficient to say "enough said." Case in point. Kan't was wrong and Can-tor right.

Up until the rise of Christianity in the Dark Ages the universe was incontrovertibly considered without a beginning or end in space or time. Exoteric Christianity, with its representational and transcendent forces of anthropocentrism, however, seized the absolute, called it God, gave it human powers and limitations, and said "Let there be light." Thus began the *world of man*, but only out of the *a priori* eternity and infinity of God.

With the operationalization and vindication of Zeno and the binary truths and axes of the infinite in the modern mathematical continuum, however, Rationality and Reason have overturned the recent confusion about origins and put the infinite of eternity back into its originary place. Kant's antinomies merely show the limits of the imagination, not of reason, as Spinoza had already shown in his *Letter XII* on the infinite. Indeed, given that mathematics itself operates on Kant's sanctified "categories of reason," a Kantian response must follow and accept the truths of mathematics and its successes with the infinite and continuous. And to cosmological concerns, those truths can indeed be applied.

For example, reasoning about the spatio-temporal infinite only becomes a real problem when we break from the implicit holonic logic of sets—and from the polarity of the infinite and finite as well as the Univocity Framework—and impose limits to the absolute, such as an absolute beginning in Time. Below, Sorenson gives us an account of Kant's first antinomy, and note that the proofs in these arguments take the form of reductios. Kant assumed that each opposing thesis—e.g. that the world had a beginning, and that it did not—could be proven by the absurdity of the other. But as we'll see, the only thesis that is absurd is the thesis that imposes these absolute limits—or absolute relativities. The infinite itself—though it can't *fit* into the imagination, but can nonetheless be understood in its percept-based terms—is the only option of the two that makes *sense*. Sorenson gives the first half of the antimony as follows:

> **THESIS**
> The world has a beginning in time, and is also limited as regards space.
>
> **PROOF**
> If we assume that the world has no beginning in time, then up to every given moment an eternity has elapsed, and there has passed away an infinite series of successive states of things. . . .

Kant assumes that this is a logical reductio, but plainly it is no such thing. As Zeno, Spinoza and Cantor have shown, there is simply nothing illogical about an infinite number or series of successive states—previous or not. This is merely the countably infinite, not the Zenonian Being-now. And together, we have seen, they are merely the interface of the transitive and

immanent/transcendent axes. The reductio merely states the temporal nature of an eternal and infinite universe, relying on the mind-boggling inability of the reader to fit this spatio-temporal infinity into his imagination. The logic itself has not been reduced to an absurdity at all, thus the thesis of a spatio-temporal beginning is unjustified by this failed reductio.

The second half, or antithesis of the antinomy is as follows:

> **ANTITHESIS**
> The world has no beginning, and no limits in space; it is infinite as regards both time and space.
>
> **PROOF**
> For let us assume that it has a beginning. Since the beginning is an existence which is preceded by a time in which the thing is not, there must have been a preceding time in which the world was not, i.e. an empty time. . . .

The logical absurdity is obvious, and thus the reductio vindicates the infinite antithesis over the failed reductio of the thesis. A spatio-temporal beginning *presupposes* the concepts of both space and time. A "beginning to Time" is a circular concept. A tautology, and a logical, conceptual *and imaginative* absurdity. Likewise, a beginning in space presupposes a space in which this boundary and beginning exists. Thus again, the infinite is merely impossible to imagine and fully encapsulate (by definition, naturally) as ONE-ALL, while the notion of ultimate boundary is not only impossible to imagine, but also illogical, i.e. circular.

To be fair, Kant's antinomies were discovered in a time prior to the mathematical resolution of the paradoxes of the infinite, and in the ignorance of the esoteric rationality of Spinoza's Triune Infinite. Thus Kant had very good reasons to side *against* the powers of reason and *with* the paradoxes and con-fusions as being inherently irresolvable.

We have seen otherwise, however, and so we can side with the capabilities and faculties of man. We have seen that the paradoxes themselves put a pressure on reason to work themselves out into nondual recognitions of the fundamental polarity of conceptualization itself. With Galileo's paradox, for example, we saw that the polarity of infinity and number worked itself out through the Cantorian transfinite orders and arithmetic of the infinite, and into the nondual-rational Triune Infinite. And through Zeno's paradoxes the mathematics of the continuum worked itself into its own ordering of the immanent infinities or singularities of the irrational and transcendental numbers, and now into philosophical understanding with the triune interface between the two fundamental VL-axes of conceptual thought itself.

PART THREE: INTERFACE PHILOSOPHY AND NONDUAL RATIONAL-EMPIRICISM

PHILOSOPHY: THE INTEGRATING ART OF THE CONCEPT

> *The Baroque artists know well that hallucination does not feign presence, but that presence is hallucinatory.* — Gilles Deleuze, *The Fold: Leibniz and the Baroque*

If mathematics is the art and science of pure relation, then philosophy is the art and science of the pure concept, which often—and perhaps best—serves the transcendent or "higher level" purpose of the inter-relation and integration of the arts and sciences (or knowledge in general). Otherwise knowledge itself remains fragmented, divided and conquered. This integration is the function that philosophy has already served throughout this text, but at the more general level (deeper in the EOTC) of meta-mathematics, as well as the meta-philosophy and meta-paradigm of the Vision-Logic Coordinate System and the Univocity Framework.

In this section, however, we delve into the traditional details of philosophy itself, instead of the areas "outside", or in the external direction away from philosophy (such as mathematics) into which philosophy often strays—offering its integrating perspective by weaving a tapestry of concepts. The problems we will encounter—with our nondual-rational integrating perspective and meta-philosophy now intact—are the common ones which, solved long ago in essence (by the nondual philosophies in general, for example), seem to persist in philosophy classes, their dualisms grotesquely exaggerated and caricatured so as to offer eternal resistance and practice for the budding philosophy student—and perhaps to keep the professors and philosophy itself employed in the modern academy. These problems include—the "mind-body problem"; the problem of free-will and determinism; the nature of knowledge (i.e. epistemology); as well as the problem of nondually integrating and inter-relating the philosophies of Spinoza and Leibniz, the two main nondual rationalists.

SPINOZA'S ATTRIBUTE POLARITY AND "THE NUCLEATION OF OBSERVABILITY"[i]

[i] The core analysis in this section was discovered and written long before my encounter with Deleuze or Wilber. For the original publication of this sub-thesis see http://home.comcast.net/~anpheon/misc/Spinozas_Attribute_Polarity.pdf. The quote, "the nucleation of observability" comes from Bucky Fuller's Synergetics.

SECTION I: BRIDGING THE INTERPRETIVE RIFT

Orientation

Before we can proceed to integrate the nondual aspects of Spinoza and Leibniz, in a later section, we must build a coherent and modern image of Spinoza as a nondual thinker. We have already done so, to some extent, in the prolegomena, and in this section we'll just clarify and resolve a deep problem in the interpretive literature emerging from the pervasive mind-body dilemma of modern western philosophy.

The deepest rift in the mass of Spinozistic interpretive literature is centered on the status of the only two attributes which Spinoza identified out of the "infinite attributes of God"; these two are Thought and Extension (or roughly mind and matter, respectively). This interpretive rift, I will argue, is caused partially by the absence of explanatory detail—what is called the "negative approach"—taken by Spinoza in his definition of the attributes. The dilemma could be posed, "Are the attributes merely a function of the *knowing mind*—a sort of perspectival or epistemic illusion—as the 'subjectivists' assert, or are they part of the very *essence* of Substance itself, as the 'Objectivists' maintain?" Must we see the Subjectivist and Objectivist interpretations dualistically as mutually exclusive options? Or could they both represent essential aspects of a deeper explanation?

As would be expected of any truly nondual approach, the interpretive rift will be resolved and supplanted through the integrative functions of polarity in general, and in particular through the nondual-rational, or trans-rational, framework already presented. In the process, a deeper causal and morphological explanation of the dual attributes as occurring necessarily at both the "objective" and "subjective" levels—or more precisely, as we will find out, at the *ontic* and *epistemic* levels (sub-representational and representational, respectively)—will be put forward.

In Spinoza's rigorous and crystalline metaphysical and epistemological scaffolding, starting from the gap in explanatory detail concerning the attributes, we will progress inward, in the opposite direction of the more dispersive, abstract/logical tangents of common Spinozistic interpretation. Instead of mere exegesis, we will generate and explore new territory, filling in some of the missing structural details to show deeper causal relations behind Spinoza's rough sketch of the attributes. This explanation can help to resolve all sorts of problems in the philosophy of mind, but we will only have time to focus on a few of them in depth, such as a more satisfactory solution to the mind-body problem, an elucidation of the "explanatory gap," and a comparison between Spinoza's "neutral monism," Nondual Rationalism and Identity Theory.

Overview of the Problem of the Attributes

While it marks a radical breakthrough in the mind-body problem in Western philosophy (or perhaps merely a more detailed throwback to the nondual approach of the concept of dependent arising and the identity of opposites), Spinoza's conception of the attributes itself contains a deeply enigmatic core. It has been noted by many authors that Spinoza's system of the attributes clearly lacks sufficient explanatory detail, and, I contend, it is this lack of detail which spawned or allowed the false dichotomy—between the Subjectivist and Objectivist readings—at the core of Spinozistic exegesis. For example, in *The Courtier and the Heretic,* Matthew Stewart says:

> One could argue that, for example, the division of Substance into the two attributes of Thought and Extension amounts only to an assertion *that* mind and body are the same thing, not an explanation of *how* the identity of these two very different kinds of phenomena comes about. In other words, Spinoza's theory, when considered as positive doctrine, may simply be kicking the mind-body problem upstairs, from humankind to God (p170).

Spinoza, it seems, had the intuition to construct the rigorous logical skeleton of the answer to the mind-body problem as a function of the two known attributes of Substance (or aspects of The Infinite), but—due perhaps to the limited knowledge of his time (or the limits of time on his knowledge)—he failed to demonstrate ***how*** this could causally, relationally or morphologically come about. Body and mind are one, yes, of nondual necessity, but ***how***, and in what way can we *visualize* that they are one?

A related problem in Spinozistic thought, which was pointed out by his friend Tschirnhaus, is that since Spinoza doesn't give a demonstration of what constitutes the causal and morphological nature of an attribute, he naturally has no explanation for why there are only two of them known. But to make matters worse, since both of the attributes, in the Subjectivist account, are interpreted merely or mainly as *perspectival* functions of the mind, modern interpretations of Spinoza's attributes commonly find an imbalance in the attributes themselves and tend to see the attribute of Thought as fundamental, or dominant to the attribute of Extension. (This, as we will see, represents an objective-ontic reductionism, of the fundamentally neutral "Attribute polarity," herein.) Stewart explains it thus (my emphasis):

> One may even doubt that these two in fact count as attributes of equal status. For, if an attribute is, according to Spinoza's definition, that which "the intellect perceives as constituting the essence of substance," then one might conclude that Extension is perceived *through* Thought, and so cannot count as being in the same relation to Substance as Thought.

As we will see, however—when we revisit these problems in the light of the deeper explanation of Nondual Rationalism that may have been only implicit

in Spinoza's system—this problem is a direct result of the two undisclosed and undifferentiated conceptual polarities at work here, the polarity of the ontic/epistemic and the polarity of Thought and Extension (or the within and the without), and these polarities *con-fuse* around the pre-differentiated I/T omni- and uni-axes.[i]* We will find that this problem can easily and intuitively be resolved, however, given the right conceptual "orienting generalizations," many of which have already been presented and others of which will follow. Stewart rounds off these problems and gives a final bit of general perspective on the matter which will help us to progress further until the problem can be addressed more adequately in the coming sections.

> These quibbles do not affect Spinoza's system in the negative, however, as a radical break and opposition to the bulk of philosophy up to that point; a rebellion against the received Platonic doctrine[ii] that the mind is a "special kind of thing, endowed with free will and immortality, whose possession grants humankind an exemption from the order of nature."

The Interpretive Rift: Subjectivism vs. Objectivism?

The generality of Spinoza's outline, especially concerning the nature of the two known attributes, has presented Spinozists with a deep enigma. This gaping hole within in the logical edifice of Spinoza's model has resulted in an explosion of logical interpretations which are often highly abstract, convoluted and frankly bizarre. In an attempt to reconcile the existing ambiguities without injecting any new explanatory or metaphysical material into the mix, each tangent ray of this discursive academic explosion follows a trajectory distorted and convoluted by the confines of this strictly hermeneutic space which is already distorted through the ever-changing lens of history in its reaction against the failed project of rationalism.[iii] This is the void left by Spinoza and only skirted around in logical abstraction by the majority of Spinozists. The view taken herein is that Spinoza did not

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[i]* See, I/T Omni- and Uni-axes, p145.

[ii] It is this platonic inheritance in the medieval system that the last renaissance man, Leibniz (in line with Descartes), wishes to protect from the onslaught of inevitable modernity initiated by the first modern philosopher, Spinoza. Descartes may have been the first philosopher employing a modern method, but his philosophy, like Leibniz's, is an attempt to protect the medieval Theocratic system. Spinoza, however, is the first of the modern's in both method and message.

[iii] Essentially, the project of rationalism failed in part due to the political/theoretical reactions against the necessary implications of the project in its dethronement and pulverization of the platonic category of the immortal human soul. Surprisingly, one of the main facilitators of the abortion of the project of rationality was also one of the progenitors of its key insights, Gottfried Leibniz himself. In his attempt to subvert his own covert Spinozism in the creation of a "popular religion" which would unite the catholic and protestant churches, he fostered a transcendent-biased line of thinking, Idealism, which was itself pre-rational (and indeed pre-postmetaphysical) in many of its key aspects. This is explicated in great historical detail in Mathew Stewart's *The Courtier and the Heretic*, and is further expanded upon in the section, Leibnoza Von Spinbitz: An Identity of Opposites, p659.

bring his project far enough to explain the percept-based source of its resultant conceptual form. For this reason we will take Spinoza's model as given—however revealed and/or distorted by the geometric methodology and the archaic medieval terminology he inherited—and we will shed light on its epistemological and ontological form through the subsequent discoveries and inventions in modern and post-modern philosophy and mathematics, both academic and on the outskirts of orthodoxy, such as the ideas of Buckminster Fuller and Gilles Deleuze.

Modern Spinozistic exegesis is divided into two main camps, the *Objectivists* and the *Subjectivists*, centered on the problematic, and supposedly ambiguous, definition of an attribute. As we will see, this division is in turn generated by a false dichotomy surrounding the interpretation of a central term in Spinoza's ultimately inadequate definition of an attribute.

The central definition of an attribute in its original Latin form is "*Per attributum intelligo id, quod intellectus de substantia percipit, tanquam ejusdem essentiam constituens.*"[i¥] The most common and natural English translation of this definition is as follows (my emphases); "the attributes are that which the *intellect perceives* of Substance **as constituting** (*tanquam constituens*) its *essence*." The term *tanquam* plays a pivotal role in this exegetic rift in that it both separates and connects two crucial aspects of the definition, the epistemic and the ontic. The phrase, "intellect perceives" represents the epistemic level (perception as a function of knowledge and representation) and "essence" represents the ontic level, and as we have seen, *ultimately and necessarily* Emptiness and Substance.

Perhaps due in part to the pre-rational and transcendent-biased[ii*] reactionary restrictions of the historically distorted hermeneutic space forced upon modern academia by its post-modern Empiricist and Idealist reaction against metaphysics (or creative ontological conceptualization), neither side can see, nor invent, a possible way to include *both* the ontic and the epistemic aspects of this definition in the final historical interpretation. Accordingly, the two camps have split precisely at this symbolic conjunction between the ontic and epistemic aspects, both of which are crucial to Spinoza's definition of an attribute. To make matters worse for our modern academics, Spinoza, being the neutral party that he naturally is—with his nondual ontic-epistemic polarity implicit in his univocal view of Substance[iii*]—unwittingly armed both sides of the debate by his *purposeful* repeated use of both aspects of the definition.

[i¥] *Ethics I,* Def. IV. quoted in Francis S. Haserot, *Spinoza's Definition of Attribute*, (The Philosophical Review, Vol. 62, No. 4 (Oct., 1953), 499-513.)

[ii*] See, Foundationalism, the Infinite Regress and the Transcendent-bias, p91 and, The Image of the Trans-Trans-Bias, 312.

[iii*] See, The Univocity Framework (UF), p153.

Since the Objectivists take the ontic view that the attributes represent the *essence* of Substance, they have the luxury of taking the most common and natural translation of an attribute, as discussed above, because the *"as constituting"* puts a clear link from the attributes to *the essence of Substance*—the attributes then become linked to the ontic or sub-representational level, *as* constituting the *essence* of Substance. For the Objectivists then, the epistemic aspect in Spinoza's definition, represented by "the intellect perceives," becomes a secondary and superfluous (yet curiously ever-present and bothersome) feature of the definition. The attributes of both Thought and Extension, according to the Objectivist interpretation, therefore *somehow* exist (though they never say how, or in what form) as part of the essence of Substance, and then merely by ontological default they extend to the epistemic level providing the support for the arguments of their epistemically-bound opponents.

The Subjectivists, on the other hand, are at a slight disadvantage, since they take the less common linguistic interpretation, the view from the epistemic pole, that the attributes represent merely the ways in which the essence of Substance can be *known*. But this linguistic disadvantage is countered or supplemented by the ubiquity of the scientific/materialist framework that tends to support this interpretation. The Subjectivist's preferred interpretation of this critical passage assigns to the Latin *tanquam* the less common meaning of *as if*[i] and the interpretation then becomes "the attributes are that which the intellect perceives of Substance **as if constituting** its essence."

This emphasis on the illusory "*as if*" enables the Subjectivists to connect the attributes to the higher-level intellect and its necessary perceptions (and perspectival illusions) in *direct opposition* to connecting the attributes to the very essence of Substance, the ontic level. The attributes are raised up from the problematic ontic-level univocity of essence as existence, and into the abstract, anthropocentric realm of the epistemic, as merely the key ways in which the essence of Substance (existence) can be known. To the Subjectivists then, the intellect ascribes attributes to Substance which "in reality" (ontic) is without them. In the forward to *Reflections and Maxims* (edited by Dagobert D. Rune), Albert Einstein—who famously spoke of himself as a "disciple" of Spinoza—gives a succinct example of a Subjectivist (scientific/materialist) reading; "Here one finds the majestic concept that thinking (soul) and extension (naturally conceived world) are only different

[i] Think here of the inflection put on this by a modern teenage girl, "as if", to get my point that this puts the attributes in the position of being illusory functions, if however necessary, of the limits of knowledge.

forms of appearance resp. conceptual interpretations of the same substance." [i]

As stated previously, Spinoza naturally arms both sides in the debate, and many other crucial passages in *The Ethics* consistently (and often simultaneously) seem to stress both the "Subjectivist" (epistemic) and the "Objectivist" (ontic) aspects. Take the following passage from *The Ethics* for instance, "…substance thinking and substance extended are one and the same substance, comprehended now through one attribute, now through the other."[ii¥] It appears quite plainly in this passage that *comprehension* (a key epistemic function) plays a central role in determining this duality because Substance is always comprehended (known) *through* one or the other attribute.

It is also quite evident that in order for comprehension to work *through* the attributes, they must already exist as prior and essential (ontic) to comprehension (epistemic)—and indeed prior and essential to "perception," as implied in the central definition of the attributes. The duality of the two known attributes is not only essential and fundamental to conception and perception, but it clearly has a connection with the essence or eternal nature of Substance. This is illustrated in the following quote from *The Ethics* [my ***emphases***], "Further, by the attributes of God we must understand that which ***expresses the essence*** of the divine substance."[iii¥] Rather than being merely relegated to the ways in which Substance can be known, the attributes themselves ***express the essence*** of Substance, and the intellect is formed in such a way as to be inherently able to "perceive" this essence "through" them, as already existing, even if emergent.

In an attempt to reach what Deleuze would call the "plane of consistency" in Spinoza's thought, we must give Spinoza the benefit of the doubt and assume that he included *both* the ontic and epistemic (or "Subjectivist" and "Objectivist") aspects in the definition of the attributes for the purpose of conceptual utilization and clarification, rather than accidentally or for the purpose of confusion. Therefore, if we can find a way to make *sense* of Spinoza's text *as it is*, that is to be preferred, even if it requires much conceptual infrastructure or meta-perspective to see it explicitly. The remainder of this discussion, therefore, will be focused on the ways in which we can understand, both visually and viscerally (intuitively), how the intellect, and indeed all modes at all levels of emergence, must be formed in

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[i] Quoted from Dagobert D. Runes editor with a forward by Albert Einstein, *Reflections and Maxims,* (New York, Philosophical Library Inc, 1965). Note that this is essentially an "integral," or "AQAL" way of thinking in terms of perspectives as fundamental. Ken Wilber's AQAL (all quadrants all levels, lines, etc), however, has two more "quadrants", which represent the plural aspects of the internal (mind) and the external (matter) perspectives.

[ii¥] *Ethics II*, Prop VII, note**:**

[iii¥] *Ethics I*, Prop. 19 Proof.

such a way as to perceive the essence of Substance through these two ways, aspects or attributes.

Given the complexity of the subject matter of the mind, the explanation will, however, necessarily still be at a general level, and we will see that it is not necessary for our purposes to dig into the neurobiology of cognitive functions in order to give an adequate explanation that appears to reach the plane of consistency in Spinoza's thought. It is true, however, that those empirically derived neurobiological explanations have indeed influenced, are supported by, and are *interfaced* in this work.

SECTION 2: THE CROSSROADS OF HIDDEN POLARITIES

Ontic/Epistemic Visa Versus Subject/Object

As the discussion above suggests, there are two critical aspects of the definition of an attribute which must be reconciled in the new interpretation: they are the *ontic* and the *epistemic*. The attributes, in Spinoza's definition, express the sub-representational *essence* of Substance and pre-exist (ontic) the representational intellect which *necessarily* perceives this essence *through* them (epistemic).

Recall that the exegetic division in Spinozistic scholarship is centered on the subject/object distinction. If we find, however, that in Spinoza's system the distinction between the subjective and the objective is a difference in the fundamental ways in which we can obtain *knowledge* about the world (as we will see below)—and as such, this subject/object duality maps squarely onto the representational domain of epistemology as only an *epistemic-level expression* of the much deeper polarity of the attributes[i]—what then does this do to the validity of the "Subjectivist" and "Objectivist" labels given to our exegetic division between the warring camps?

Furthermore, as we will see, this nominal problem is due to the hidden nature of these dual polarities and the subsequent modern tendency ("flat-land materialism") to collapse the objective into the ontic as foundational and to raise the subjective to the secondary, and at best *emergent* epistemic. The other modern tendency ("idealism") is to react and counteract this object-reductionism with its opposite replacement in a flat-land subject-reductionism. This gives us the opposing equations, *object = ontic* vs. *subject = ontic*, which gives us the relational nuclei of the twin poles of this exegetic rift.

The nondual-rational solution to this problem of foundational imbalance and tacit-dualism[ii]* will be facilitated, naturally, through use of the VCS[iii]* and the Univocity Framework[iv]* as a conceptual reference system for understanding and explicitly maintaining the crucial distinction at the crossroads between these con-fused orthogonal polarities—ontic/epistemic

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[i] …or as the two upper quadrants in Ken Wilber's epistemic "AQAL matrix" in his *Integral Methodological Pluralism*.

[ii]* See, Univocity: Monism, Polarity and the Nondual, p156).

[iii]* See, The Vision-Logic Coordinate System (VCS), p123.

[iv]* See, The Univocity Framework (UF),, p153.

and subject/object, as well as the univocal absolute/relative—and for keeping these polarities from collapsing upon themselves, and/or into each other.[i]

The VCS, as we have seen, consists, in part, of the two polarities; the transitive and the immanent-transcendent (I/T) axes. And within the I/T axis, recall, we have a further distinction between the omni- and uni-axes. Recall also their interfaces; the interface of the omni-axis, recall, is the "transitive plane" and the interface of the uni-axis is the sphere—our finite unity as the simplest (omni-symmetrical) bounded infinity. See Figure 8, repeated below from p149. We will find that in this new model the ontic-epistemic interface, being in part a socially constructed or emergent function, fits the form of a transitive plane, the interface of the omni-axis, and the objective/subjective interface, at its basis in the individual, fits the general spheroidal or bounded form of the interface of the uni-axis.

The employment of this system, we will see, makes explicit the precise distinction and critical interaction between the core polarities con-fused in this exegetic rift and therefore solves the nominal, categorical and conceptual confusions surrounding the nature of Spinoza's attributes and the relation of mind to body and both to God or Substance (or form to Emptiness) in general. It is because individual awareness exists as an interface at the center of this crossroads of polarities, undifferentiated in earlier thought, that the distinction is so difficult to perceive, and to keep distinct. We will find that once this is visually and conceptually outlined in the imagination, however, it becomes rather intuitive to maintain and highly effective and precise in operation.

[i] Ken Wilber's AQAL matrix, useful as it is at the epistemic level, is not quite adequate here because it does not explicitly address the ontic/epistemic polarity. This is because it takes as given, at least on the surface, the modern academic (exoteric) post-modern rejection of any ontic-level claims. For our purposes, suffice it to say that Wilber's post-metaphysics relies on a peculiarly medieval notion of metaphysics as reliant on the "Great chain of Being" (GCB). (This is explained in more detail in the section *Clearing* Away the Dust of the Great Chain of Being, p37) Although a common academic interpretation of Spinoza (fostered by Leibniz and Hegel, for example) is that he offers an essentially materialistic system. A more informed and perhaps more common view, taken by Bertrand Russell for example, is that Spinoza's system is neither a materialism nor an idealism, but rather a neutral monism. One of the critical criteria for a post-metaphysical model, according to Wilber, is that the GCB become subverted from its matter-to-mind hierarchy (though it is odd that Wilber doesn't address the inversion of this hierarchy in idealism) and these essential distinctions become epistemic and perspectival, such as the inside vs. the outside points of view. This is precisely the interpretation of Spinoza herein, and at the general level, it is not an uncommon interpretation. Note also that this interpretation herein was arrived at long in advance of this author ever discovering the work of Ken Wilber, and was explicated in the original publication of this article on 7-31-04

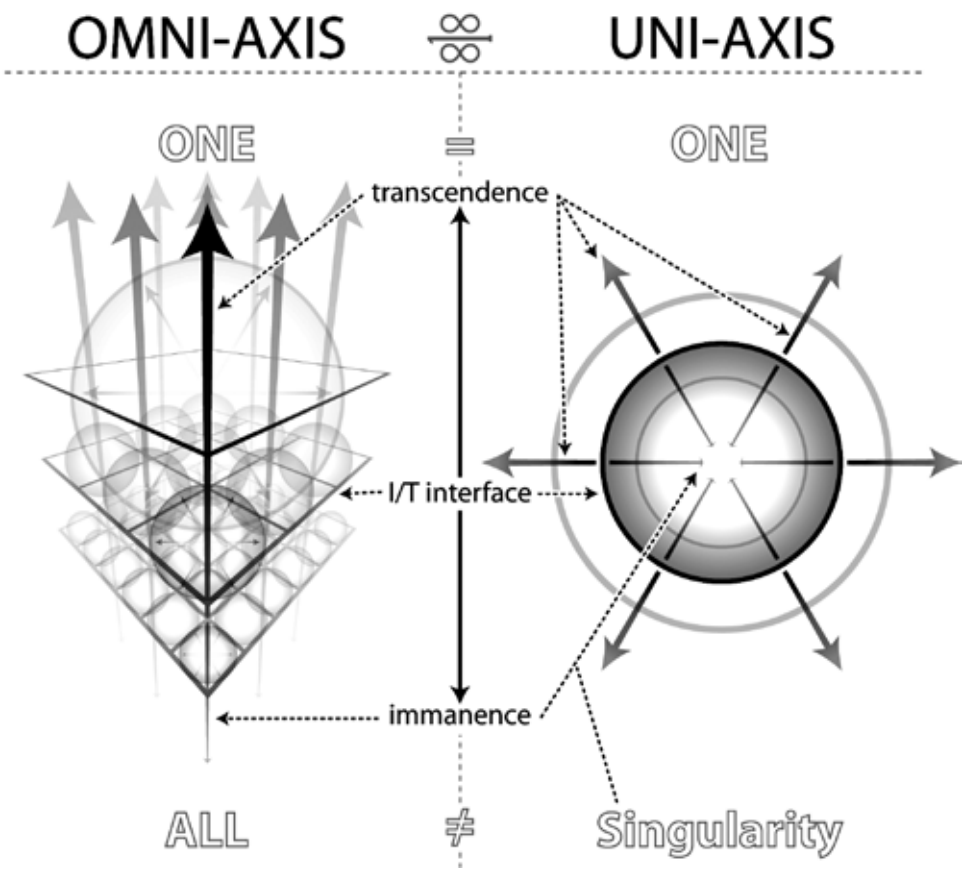

Figure 8: Omni- Uni- Interfaces: Repeated from I/T Interfaces, the Omni-Uni and the Omni-Non.

The Ontic/Epistemic Polarity

Clarifying Our Terminology: The Objective-Ontic Shift

One important factor in the categorical and conceptual confusions that we are addressing is found in a subtle "semantic drift," or change in the meanings of some of these terms from the meanings that Spinoza originally employed. In our scientific age, the current meaning of "objectivity," or "the objective world" has become synonymous with the world of physics and indeed, due to the default scientific materialism, or scientism of our age, it has become synonymous with reality itself, i.e. the ontic. Thus the objective is generally taken as fundamental and foundational to the world of thought (the 'subjective,' now demoted to the superficial level of the epistemic), as if

one could reduce thought to a few laws and principles, or indeed (and perhaps the height of absurdity) to "an equation that could fit on a T-shirt."[i]

In Spinoza's time in general, and in his writings, however, the term 'objective' referred to the *observations* of external reality rather than to that reality itself. Therefore, 'objectivity' referred to our ***knowledge*** of the *external* world and 'subjectivity' referred to our ***knowledge*** of the *internal* world. This distinction between the ontic and the objective (and by corollary to the subjective) is encoded in the Aristotelian distinction between *actual* or *formal* reality and *objective* reality, which Spinoza incorporated wholesale into his terminology via his study of earlier philosophers, such as Descartes. Indeed, this is made explicit with an editor's note from Spinoza's *Ethics*[ii¥] (265):

> Spinoza is here using a scholastic distinction which is also used by Descartes, (…where Descartes distinguishes between 'actual' or 'formal' reality and 'objective reality'). When Spinoza speaks of the 'formal essence' of something, he means the essence of that thing as it is in itself. On the other hand, to say that something exists 'objectively in God's intellect' is to say (a) that its existence is mental and (b) that it is *representative of* something.

With the Newtonian scientific revolution of the 17th century, however, and the wild success and ascendancy of pragmatic mathematics, physical principles and Laws of physics—at the expense of causal or ontological speculation and explanation, and its roots in scholastic terminology—the meaning of 'objective' slowly became synonymous with the ontic, and came to refer to the reality itself whose Laws we felt we were uncovering, e.g. Galileo's book of Nature written in the language of mathematics.[iii]

With the "Scientific Revolution"—in which Spinoza's system was spurned for Descartes' and Newton's respective "mechanistic" dualities—a corresponding shift in the meanings of these polarizing terms (objective and subjective) has followed suit. With this ontic shift toward objectivity, the

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[i] Matthew Stewart, in his book *The Truth About Everything* notes quite presciently that such a reduction to man-made and arguably ideal laws discloses a polarity reversal (See, Principle 4: Chord 3: The Principle of Absolute Reversal (PAR), p117), in that materialism becomes an idealism when matter reduces to merely the ideal laws of physics. Indeed we can see this quite clearly in the operations at the empirical edges of physics where the function of the conscious observer in the collapse of the wave-function is taken to be the reality itself. Stewart comically calls this problem "The Schmiderialism Principle" (p. 309) and indeed it is a problem of mistaking descriptive (epistemic) protocols, subjectivity or objectivity for the formative, ontic or sub-representational level.

[ii¥] Translated by Andrew Boyle with notes by G.H.R. Parkinson (Orion House; USA, 1993)

[iii] This shift was also catalyzed by the operationalization of the intrinsic solid bias, the attempt to search only for the ultimate in terms of particles. This solid-bias, in turn, debilitated the causal reasoning of the physicists of the 20th century when they encountered the vast fluid complexity of the quantum world with its "zoo" or particles which appear far more like fleeting wave resonances and vortices than anything solid.

delicate neutrality of the Spinozistic relation between the *epistemic* aspects of subjectivity and objectivity, in balanced and polar opposition to the *formal* reality of the ontic, became unbalanced. This facilitated the problematic dissolution of Spinoza's central distinction between the ontic (formal) and epistemic aspects of his attributes and the epistemic-level duality of the subjective and objective.[i]

Therefore, to understand Spinoza's meaning concerning his attributes and their relation to objectivity, subjectivity, the ontic and the epistemic, it will indeed be useful to return to the original neutral meanings of these terms before the polarizing and unbalanced ontic-objective collapse into materialism and its reactionary form in idealism. This will indeed help clear away the errors resulting from the interpretations based on the blurring of this crucial distinction.

The New Ontic/Epistemic Polarity

Since the more precise semantic mapping of this Objectivist/Subjectivist interpretive split is on the ontic/epistemic polarity respectively[ii] we will use the more correct ontic/epistemic distinction throughout the rest of this discussion, with the new understanding that the object/subject divide occurs only at the level of representation. The new question at the core of the problematic exegetic division then becomes; ***Are the dual attributes essential to the nature of Being[iii] (ontic) or are they aspects of a bifurcation in perception/conception (epistemic) and secondarily imposed on sub-representational reality (the ontic)?***

As we will see, to our advantage this new interpretation puts the "explanatory gap"—the kernel of the mind-body problem—squarely in the

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[i] Idealism quickly emerged and constantly re-emerges as a healthy countermeasure to the ontic-objective reduction thus attempting to balance the imbalance, but it is still a minor reactionary sub-paradigm on the margins of the default materialism.

[ii] It is ironic that the two camps spontaneously divided upon a line which is emergent from the fundamental division of the attributes themselves. The subjective and the objective are the names of the two attributes at the level of "excellence" (in complexity) corresponding to that of a cognitive mode, such as an animal brain/mind. So if the exegetic division occurs between the actual attributes—at the epistemic level of object and subject—then clearly it is an erroneous mapping unless one wishes to deny the existence of one or the other attribute. But this may indeed be the underlying driving factor due to the natural tendency of the human mind for absolutizing inherently relative knowledge systems or interpretations. This spontaneous division only goes to show the actual pervasiveness of the fundamental polarity. It exists at all levels of modification, from a-tom to episteme.

[iii] Hegelians may jump at this chance to reaffirm to themselves their favorite interpretive error, namely that Spinoza's substance is inert, passive and rigid because, as they suppose, it excludes the concept of Becoming. This is a common misconception about Spinoza's substance, but Spinoza claimed in his *Short Treatise on God, Man and His Well-Being,* that "since substance is [the cause] and the origin of all its modes, it may with far greater right be called acting than passive." Spinoza's substance does not equate to the modern physics notion of inert, dead, blind and stupid matter and it cannot in any sense be passive because it is the root of existence itself.

realm of the epistemic, or in representation where explanation indeed occurs and where it becomes easily dealt with as a natural consequence of the limits of representation.

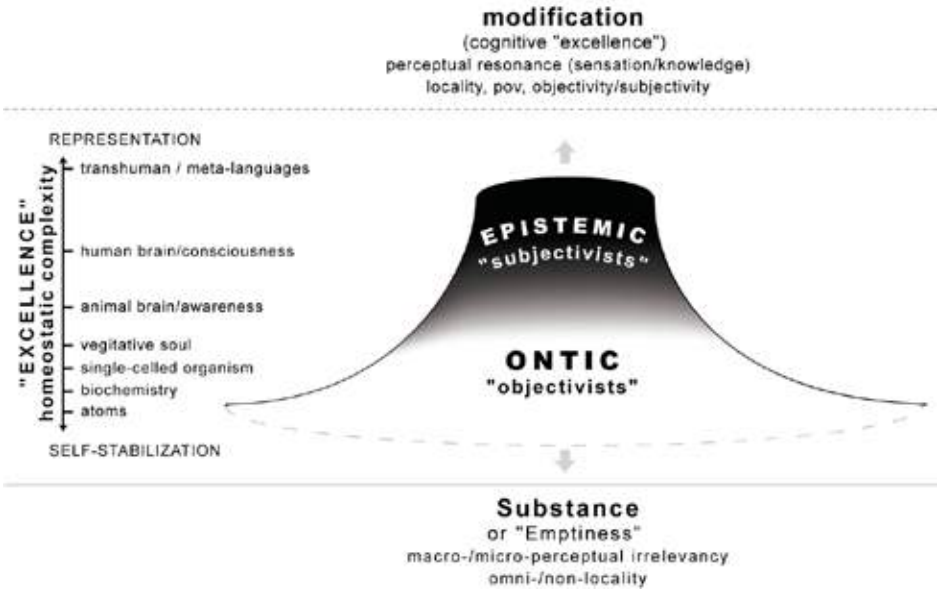

Figure 64: Objectivist/Subjectivist Remapping to the Ontic/Epistemic Polarity: The more precise mapping for the Subjectivist/Objectivist interpretive rift is along the ontic/epistemic duality. However, this duality is more properly conceived of as a morphological gradient or 'polarity' between the minimal complexity of basic self-stabilized modification, at the ontic level, and a specific cognitive, representational type of complexity denoted by Spinoza's term "excellence," at the epistemic level. In this view, the "Subjectivists" map the attributes to the epistemic level and the "Objectivists" map them to the ontic level, yet both objectivity and subjectivity exist at the epistemic level as the emergence—through evolutionary representational complexification of cognitive holons—of the two attributes.

In concurrence with Gödel's Incompleteness Theorem and with philosophical "Fallibilism," the mind-body problem now merely demonstrates the limits (or fallibility) of all representational systems—whether subjective, objective, mathematical, linguistic, aural or visual. No system of explanation and no method of observation can ever be absolutely complete and infallible because all representational and explanatory systems are based in the epistemic realm as emergent finite abstractions and observations. In Spinoza's system, however, the immanent causation of Substance is infinite in extent and resolution (i.e. continuous—via our

Principle of Nondual Rationalism, infinite division equals indivisibility) and thus cannot be encapsulated by an abstract and finite representation. In this way, it is only natural that objective accounts can never absolutely explain the subjective experience (and vice versa), and indeed the need for them to do so becomes revealed as a simple categorical error between the objective and subjective modes of knowing.

When placed into relative terms, the two modalities of experiential knowledge (subjectivity and objectivity) become understood as symbiotic[i]*—and indeed entirely unthinkable, one without the other—rather than contradictory and mutually exclusive. In addition, the interpretation to follow, bridges the exegetic gap by demonstrating visually and viscerally that the attributes necessarily have both an ontic and an epistemic nature—exactly as Spinoza's original text abstractly demands.

Clearly then, to retain this vestigial exegetic Subjectivist/Objectivist nomenclature would be to suggest that both camps are centered on epistemic functions—rather than the Objectivists being centered on the ontic-level *essence* of Substance—and so the old terms are in connotative conflict with the interpretive distinction which we are attempting to illuminate. So to reinforce and clarify the functioning of this interpretive division we must remap the distinction to a more precise semantic polarity. We will then be in a position to further explain the exegetic duality as the two poles (ontic and epistemic) within a morphological gradient of a specific category of cognitive/representational structural and functional complexity (Spinoza's "excellence"),[ii] rather than the two categories of the epistemic—the objective and subjective modes of knowing.

The Attributes as Both Formative and Descriptive Protocols

A common materialist or Subjectivist interpretation of the attributes is that they are a sort of "descriptive protocol"[iii¥] where an analogy is drawn between opposing types of description for the same event. Examples of these descriptive protocols include; reading sheet music vs. reading a vivid description of the very same music – a chemical spectrograph listing all the components of a fine wine vs. a wine-taster's flowery and poetic descriptions

[i]* See section 2.5 "Emergence, Mnemonic Primitives, and the Symbiogenesis of Subject and Object"

[ii] "For the excellence of ideas, and the actual power of thinking are measured by the excellence of the object." *Ethics III,* General Definition of the Emotions

[iii¥] Darren Staloff, *Great Minds of the Western Intellectual Tradition: Lecture 33: Spinoza—Rationalism and the Reverence for Being,* audio CD of a lecture for The Teaching Company (http://www.teach12.com). In this lecture Staloff defined Spinoza's attributes as "descriptive protocols."

of the same wine – a rigorous objective account of the salient features of a photograph[i] vs. a subjective impression of how it makes one feel.

Spinoza does indeed seem to support this general descriptive (epistemic) view and an analogy of a purely nominal distinction was given by Spinoza in *Letter 9* to De Vries. However, as already noted, there is much textual evidence that the attributes are more fundamental than this purely epistemic view would imply. Another hint at the incompleteness or inaccuracy of this view is that the number of descriptive protocols known to man, is indefinite. If, however, as Spinoza says, there are only two known attributes, and even in Spinoza's day the number of known descriptive protocols was far greater than two, then clearly the "descriptive protocol" analogy can only point to an important *aspect* (the epistemic level, or "Subjectivist" account) and not to the complete understanding of the two attributes.

A crucial clue is provided by the observation that all the descriptive protocols fall into two main categories[ii]—the subjective and the objective. For instance; the wine-tasters description is a *subjective* protocol drawing on the common pool of qualitative, *internal* human experiences, whereas the chemical spectrograph is an *objective* protocol drawing on quantitative descriptions or measurements of *externally observed* reality. Another more relevant example is the distinction between a "folk-psychology" description of mental states, which is clearly a subjective account, and those same states described in the objective, quantitative terms of a functional MRI brain scan.[iii]

Clearly then, if the "descriptive protocol" concept is to be useful, we must take subjectivity and objectivity themselves as the two "fundamental descriptive protocols" at the root of the epistemic level of the attributes. However, in accordance with Spinoza's inclusion of both epistemic and ontic levels in the definition of an attribute, we must also extend this polarity down to the ontic level as what will be called the "formative protocols."[iv] Note also that this is in accord with Ken Wilber's two upper quadrants, the singular IT and I, corresponding to Extension and Thought, respectively.

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[i] or even a binary description of a digital photograph, but this seems to be in a specialized category, that of the constructive protocols, such as DNA. In Golem XIV, Stanislaw Lem calls them "causative languages."

[ii] And Ken Wilber would argue, quite effectively perhaps, that there are ultimately four; his AQAL quadrants.

[iii] Ken Wilber has mapped out these two "quadrants" sufficiently for our purposes, and we need not belabor this point. For further demonstration of this distinction, see virtually any of Ken's books on his integral model.

[iv] A causal explanation of how the formative protocols might function is beyond the scope of this paper. At the foundation, this Spinozistic interpretation ties into and draws from a new unified model of physics called "Sorce Theory." For more information see http://www.anpheon.org .

The Attribute Polarity: "Unity is Plural and at Minimum Two"

The Intersection of Polarities and the VCS

Recalling our *Principle 8: Chord 6: The Quantitative Principle of Finite Unity (or The Principle of Holonic Polarity)* (p249), "Finite unity is plural, and at minimum two," which we adapted from Buckminster Fuller's own maxim, we have here the general polarity of the within and the without, as it applies in the two directions of the representational and the sub-representational realms, or the epistemic and the ontic, respectively. The interface here, recall, is the sphere, our interface of the I/T uni-axis forming the boundary of the finite unity. The polarity of this interface, however, cuts down through the interface of the ontic/epistemic polarity, which, recall, is essentially a transitive-plane, given that the ontic and epistemic realms are not centered on a single location, and thus not located on any given uni-axis, but rather, effectively omni-local, with the epistemic seen as transcendent or irreducibly emergent from the ontic.

Within the ontic/epistemic morphological gradient polarity, then, there is another much more clear-cut division in the orthogonal direction cutting down through both the epistemic and ontic forms of modification. Conceptually these two orthogonal divisions (polarities) form a cross where they meet; a crossroads. Subjectivity and objectivity are at the epistemic level of the morphological gradient where the modifications become sufficiently and properly complex for the representation of knowledge primitives (qualia) and systems thereof (language, science, philosophy, etc.). But—looking inwardly from the default transcendent perch of internal or external empiricism—the epistemic polarity fades down into the raw attributes of Thought and Extension toward the *absence* of such specific forms of representational complexity. This absence of representation is denoted by the term ontic (see Figure 65, below).

This distinction, again, follows the difference between the triune interfaces of the I/T omni- and uni-axes. The subject/object, or Thought/Extension interface is the generalized sphere, whereas the ontic-epistemic triune interface, being a collective of subject/object interfaces emerging at roughly the same scale of action, is a transitive plane. (Recall Figure 8, above (repeated from p149).) Once the singular (ONE-one) cognitive interfaces emerge from the massively complex collective level below it, a new transitive plane of interacting cognitive units emerges along with it. This new collective representational level, or transitive plane, is the epistemic as it emerges irreducibly from the ontic. The gradient between them is the ontic-epistemic interface, born from the communion of multiple cognitive, perceptive agents—each one an infinitely detailed interface

between infinite immanence (yin) and transcendence (yang) on a uni-axis interfacing with an internal and external environment, both representational and sub-representational, in its emergence into view.

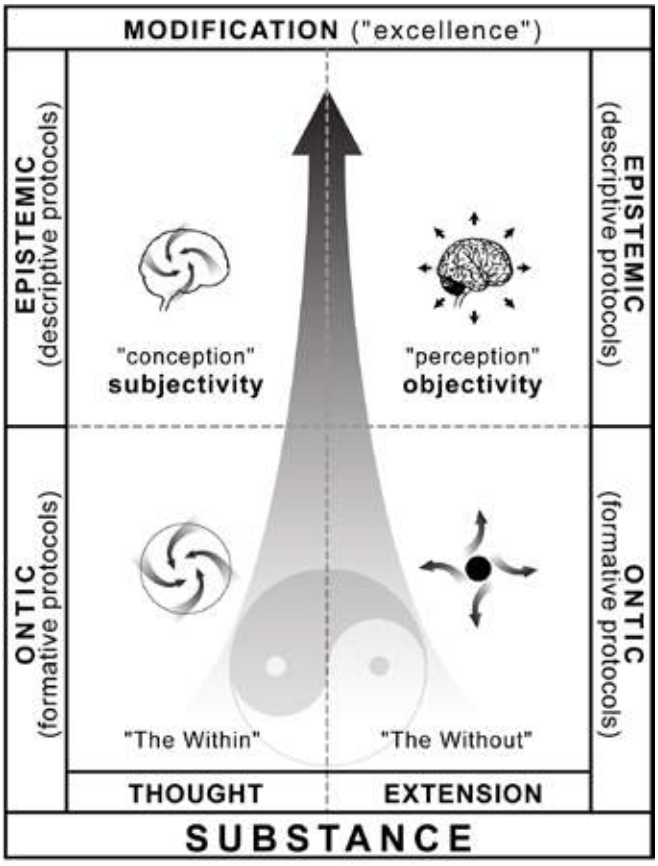

Figure 65: Ontic/Epistemic Orthogonal Quadrants:
The attributes give rise to both the "descriptive protocols" ("subjectivity" and "objectivity") at the epistemic level (demarcated by a specified degree of representational complexity), and the "formative protocols" at the ontic level as a necessary aspect of the essence of Substance in the formation of modes. In this conceptual schematic, the duality of the attributes is revealed to be orthogonal to the ontic/epistemic duality and they form a cross in the middle.[i]

[i] For those informed of Ken Wilber's *Integral Methodological Pluralism*, this quadrant map is entirely orthogonal (a side view) to Ken's AQAL matrix which would be seen edge on as the line between the ontic and epistemic quadrants. This is because Ken's map deals exclusively with epistemic functions as they fade down into the ontic level. Accordingly, when visualized as extended into 3d space

Cognitive Interfaces – The Nucleation of Observability

All modification can be understood ultimately as a "breaking of symmetry," a conceptual transformation from the omni- of non-locality[i] into the uni- of a single locus in contradistinction to its surroundings. Recall at this point our Cycle of Unity from the apoapsis ONE-ALL of the I/T omni-axis to the periapsis ONE-one of the uni-axis and its spherical interface of the generalized finite unity or mode. A finite unity, in the *real* world of infinite difference and form, is never a perfect sphere, as Buckminster Fuller made so clear, because, as Deleuze would also agree, all infinite levels of reality (transitive planes of existence) are actively modified and thus infinitely complex in their immanent details (infinite determinism equals indeterminism[ii]*). If, like the brain, the modification is sufficiently complex within the morphological space of representational capabilities ('excellence'), this locus becomes a *conscious*[iii] "point of view." This gradient of *representational* complexity—our singular interface and the crossroads for our double polarities; ontic-epistemic and Thought/Extension—is captured in Spinoza's text, "For the excellence of ideas, and the actual power of thinking are measured by the excellence of the object."[iv¥]

From Modes to Heaps and Holons

When dealing with the forms of Emptiness at the limits of observability there are two main "fundamental" or general types of morphologies; they are the 'particle' and the 'wave,' both of which are entirely interconvertable and symbiotic—as modern physics has demonstrated at the quantum level.[v] The wave is inherently unstable and non-centering and thus it propagates in the "attempt" to equilibrate with its surroundings, so to speak. The particle, on the other hand, is a self-stabilized "nucleus," *actively*, continually, and

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informed by the categories of the AQAL matrix not shown in this map, a new set of four cubes is formed for the two "objective and subjective plural" quadrants as they extend from the epistemic AQAL modalities into the ontic nondual-rational modalities forming a total of eight cubes when combined. In this extended map of the orthogonal intersection between the nondual-rational ontic-epistemic polarity and the AQAL singular-plural polarity, only the singular quadrants are visible in the diagram here, and under consideration in this immediate discussion, except as necessarily implied in the plurality inherent in the sub-unit architecture and the transitive-plane of the omni-axis, etc..

[i] The omni-local is the identical inverted pole of the non-local. Neither of which are local because a location requires a field of otherness to give it reference; the omni is negating the local because it is all-encompassing and thus not located and the non-local is quite obvious as a negation of the local.

[ii]* See, Principle 5: Chord 4: The Principle of Infinite Determinism (PID), p186.

[iii] Consciousness herein is based on the human as exemplar and generally connotes a ***representational*** level of awareness as opposed to a general universal reactivity or within-ness /immanence.

[iv¥] Ethics III, general definition of the emotions.

[v] See "The Antipodes of Organization" in the article, *Sorce Theory: Unlocking the Basement*.

inertially centering upon itself. This structural stabilization, geometrical localization and nucleation imparts an inherent morphological polarity which we have already encountered in Buckminster Fuller's statement, and our quantitative principle of finite unity, "unity is plural and at minimum two" (1000.0); a nucleus, or any other emergent volumetric localization, possesses an inside and an outside with a triune interface dividing (and indeed connecting) the two. It is the interface that is the source of both the duality and the unity because it is simultaneously the energetic divider and the immanent causal (emergent homeostatic) connector.[i] Furthermore, in Spinoza's univocal Substance as infinitely divided (ala Leibniz, as well) and thus indivisible, all transitive interfaces (dualities and polarities) must be seen, at a deeper level, as gradients given the proper power of perceptual resolution.

These most basic of nuclei are what Spinoza calls the "simplest bodies" and it is no stretch to see that all further self-stabilized agglomerations (Spinoza's "composite bodies") and compounded homeostatic complexifications of these nuclei (e.g. cells, objects, brains, etc.) must also possess an interface (e.g. cell-membrane, retina, skin, skull, etc) separating the outside from the inside for perceptual, regulatory and safe-guarding purposes. It is also quite well known in the biological sciences that self-stabilization (e.g. biological homeostasis and/or evolution) is always an integral and symbiotic interaction between object and environment, via an interface or variously structured and functional membrane. Since the observer is always a self-stabilizing homeostatic "organism" we see that the nuclear quality of all modes and finite unities gives an inherent polarity to observability itself (see Figure 66, below). As Buckminster Fuller points out, "All observability is inherently nuclear because the observer is a nucleus" (1005.32).

This property of emergent homeostasis, recall, is the defining feature of Spinoza's concept of modal essence. This same homeostasis, organizational coherence and emergent unity is also the definition of Leibniz's "principle of unity," which he says all "substances" must possess. And further, this same list of properties is the defining feature of a holon, in Integral Theory. Such holons include, a particle, a higher level nucleus, a cell and a human being. And so we can see a resonance between Spinoza, Leibniz and the Integral models. It is important to note that only certain types of modes which possess this homeostatic and fully relative, dependently arising essence can be considered "holons". All other modes are merely collections of deeper modes with no coherence, persistent modal essence and no principle of unity. Such modes are "heaps," not holons.

[i] This concept of holonic emergence corresponds to Leibniz's "principle of unity" which serves to define his conception of substance.

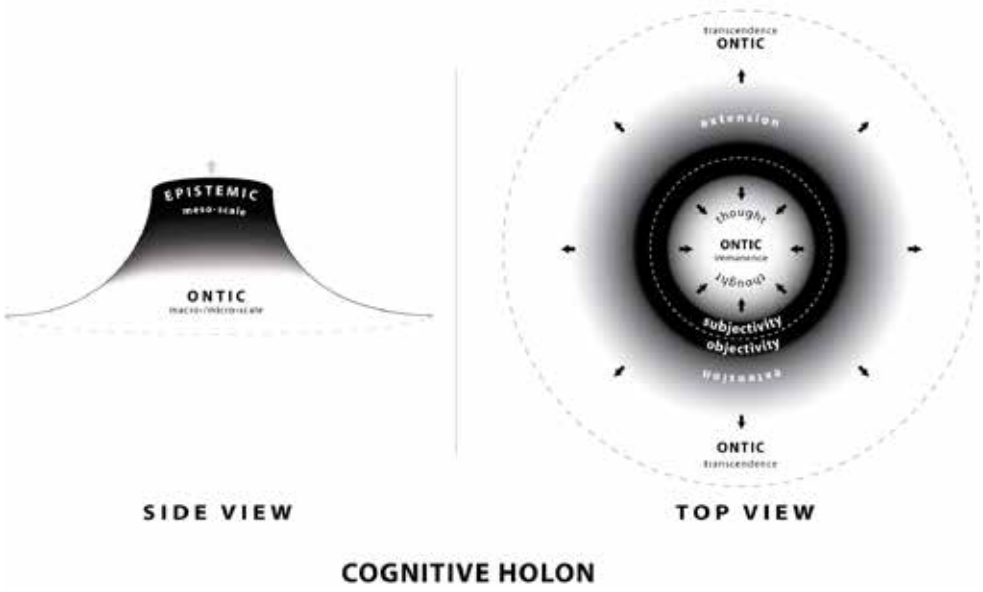

Figure 66: A Cognitive Modification or Holon:
Human consciousness, i.e. perception/conception and the forms of representation, is an emergent phenomenon which functions at a specific and limited region of frequencies (transitive plane) in the continuity ("infinite divisibility") of Substance. As an emergent phenomenon, human-consciousness is herein depicted as a finite 3-dimensional gradient interface (an abstract cross-section of a sphere projected into a representational state-space) between the infinities of micro- and macro-perceptual irrelevancies. Those vast scales of size, with which the perceptual/conceptual apparatus does not resonate, and thus cannot tune-in, are irrelevant to the organism's cognitive homeostasis functions. It is the finity of this emergent representational surface (bounded finite unity), between the within and the without, which provides the analogy for understanding the inherent limits of all systems of representation, i.e. descriptive protocols, when confronted with an infinite and omni-local causal reality.

The cognitive or representational organism emerges from the sub-representational medium as a function of evolutionary intelligence (problem-solving capability) in limited sensorial resonance with an unlimited, yet infinitely modified (infinite determinism equals indeterminism) environment. Loosely speaking then, a cognitive mode or holon has a finite emergent representational "surface"[i] or interface with two

[i] This surface is an abstraction for the emergent nature of consciousness and must not be taken for a visually distinguishable barrier. It is likely that the actual subject/object interface is indeed quite distributed in the brain as the "mnemonic primitives" discussed in section 2.5.

general "directions" of functionality—within and without, intrinsic and extrinsic, or roughly immanent and transcendent. At this cognitive/representational level these directions correspond respectively to Spinoza's use of the terms "conception" and "perception" and the epistemic duality of subjectivity and objectivity, i.e. the descriptive protocols. This representational interface can even be quasi-located in the membranes and surfaces corresponding, though not reduced to, the centers of higher cognitive function, such as the distributed centers of memory and sensory processing, or the language and planning centers of the cortex.

The polarity of nucleation, with its attendant quantitative principle of finite unity, is the structural and causal core of the twin attributes, absolutely fundamental and essential to the formation (ontic) and representation (epistemic) of all observing and observable finite modifications or modes. It is a causal necessity that the intellect perceive the modes of Substance in these two fundamental ways—either viewing its own cognitive mode or holon (itself) from within (subjectivity) or viewing other modes (cognitive or not) and their extended interrelations from without (objectivity).

The perception of the extended field of inter-relating, nucleated, and/or compounded nuclear agglomerations, is radial and *external* to the cognitive (sensorial and mnemonic) interface, whereas the conception of the thoughts within is *internal* to that interface. This nucleation structure and duality is necessitated by the causal nature of the emergence of self-stabilization and its modal-conjugates and cellular complexifications such as those architectural monstrosities, the modes of cognition. The inherent nuclear polarity—the descent in The Cycle of Unity from the ONE-ALL to the ONE-one uni-axis and spherical interface of the finite unity—is therefore the ontological core (formative protocols) of the split (explanatory gap) emerging into the epistemic level, between the descriptive protocols of subjectivity and objectivity.

In this way the epistemic aspect of the attributes (the descriptive protocols) find their causal/structural and ontic roots in the symmetry-breaking, fundamental, formative protocols of modification in generalized nucleation—and taken together we find the deeper meaning of Spinoza's attributes as both an epistemic and an ontic morphological and formative division inherent in the nature of Substance (or Emptiness) in the formation and expression of modes (recall Figure 65, above, and see Figure 70, below—p503 and 523, respectively). And the epistemic understanding of the nature of this ontic division provides the subsequent intuitive and visual/visceral union of the mind/brain duality by the "cultivated (and

cultivating) third"[i] of the emergent nuclear, cellular, organismic, or cognitive interface symbiogenetically arising between them.

Thus the perceived ambiguity in Spinoza's definition of an attribute—which appears to suggest both "subjective" and "objective" interpretations simultaneously—is rendered coherent when their dual ontic/epistemic nature is exposed as a necessary formative nucleated polarity inherent in the very nature of active Substance as it is modified (evolved) along a morphological gradient into an increasingly complex series of ever more cognitive/representational modes (brains/minds). And simultaneously, the false dichotomy of the exegetic rift between the Subjectivists and the Objectivists is rendered visible and defunct when the epistemic and ontic understanding of an attribute is at once made clear. *Without* this symbiotic inside/outside distinction, modes simply cannot self-stabilize, exist and be perceived or conceived. And a modification with an inside and an outside is always extended and thus capable of interrelation with other modes in the field of extension.[ii]

Despite the duality inherent in the formative protocols of nucleation, Substance itself always remains univocal and continuous (though not homogenous) and this continuity (infinite division equals indivisibility) is in fact key to its formative protocols[iii] and the emergent interface separating, uniting and enabling the nuclear differentiation in the first place. The definition of polarity as "the possession or manifestation of two opposing attributes,"[iv¥] references this fundamental unity and polarity beneath the duality of the attributes.

A Note on the Attributes

Materialists (or "Subjectivists" in our outmoded Spinozistic nomenclature), though they sometimes find a deep resonance with Spinoza, nevertheless often have difficulty with the idea that Spinoza's attribute of thought pertains to the ontic level (erroneously assigned to the Objectivist camp in the objective-ontic shift) and thus to all modes, whether or not they possess a brain and thus a perceiving intellect. To them this seems to mean that objects such as trees and rocks are sitting around thinking, like we do. However, at about this point Spinoza says, "The propositions we have advanced hitherto have been entirely general, applying not more to men

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[i] See Michel Serres for discussion on his concept of the "cultivated third". I have merely emphasized the ontic, or a priori and active/formative aspect of this polarity-triuning interface, or third.

[ii] Thus the modern physics concept of the "zero-dimensional point particle" is a mathematical abstraction—albeit a perhaps necessary simplification—which has been substituted and confused for the reality it represents.

[iii] See my article, *Sorce Theory: Unlocking the Basement*.

[iv¥] From http://www.dictionary.com

than to other individual things, all of which, though in different degrees, are animated [animata]."[i¥] This "anima" is the immanent active causation *within* all things (corresponding to the existential idea that existence, an active property, precedes *individual* essence[ii]*), and as Spinoza says in his *Short Treatise on God, Man and His Well-Being,* "since substance is [the cause] and the origin of all its modes, it may with far greater right be called acting than passive."[iii]

Spinoza makes it clear that the attribute of thought is an interior existence, experience, or point of view whose degree of "excellence" is dependent upon the degree of "excellence" of the mode doing the existing perceiving or conceiving. As Spinoza says, "For the excellence of ideas, and the actual power of thinking are measured by the excellence of the object."[iv¥] This collective degree of excellence is the morphological gradient and *interface* between the ontic and epistemic where the modes at the epistemic level (a somewhat arbitrarily defined level of cognitive complexity somewhere between the level of the human brain/mind and, say, an amoeba) would be considered "cognitive modes," or cognitive holons.[v]

In Spinoza's system then, the term for the attribute of "Thought" is misleading in many respects because it generally connotes *to us* our own human intrinsic/subjective and epistemic experience and then seems to project this connotation onto the fundamental nature of reality. This is clearly an erroneous reading, however, and this is qualified by Spinoza's stipulation of the gradient of "excellence" as interpreted herein.

It is possible that Spinoza used this *now* problematic term because he recognized the continuity of the morphological gradient of representational intelligence (what we might indeed call "thought") and wished to forestall the reduction of either mind or matter to the other. And accordingly, Spinoza extended the attribute of Thought all the way down the infinite, immanent gradient of excellence (or "depth" as integral theorists would call it) to objects which we would not ordinarily consider to be thinking at all, but which nonetheless do indeed have an *inner aspect of existence* conceivable *only* through the attribute of Thought (i.e. from within) in contradistinction to the outer interrelational aspect perceivable and conceivable *only* through the attribute of Extension.

[i¥] *Ethics II*, PROP. XIII

[ii]* See, Univocity and Essence, p170.

[iii] This, recall, directly contradicts Hegel's main criticism of Spinoza's Substance as rigid. Again, Substance is Emptiness, the absolute scope. It can no more be called rigid than floppy. Polarities do not apply.

[iv¥] *Ethics III,* General Definition of the Emotions

[v] Note that only certain types of modes would be considered holons. These holons are modes with a bounded synergetic unity and a homeostasis, where the

This is yet another case in which Spinoza seems to have intuited critical aspects of modern science; this time it is the property that complexity scientists call "emergence." With this understanding, Spinoza recognized the impossibility of ascribing an exact line of demarcation on the gradient between the morphological instances of the 'thinking' and the 'unthinking', the 'conscious' and the 'unconscious', the 'intelligent' and the 'pre-intelligent', or more generally the 'cognitive' and the 'pre-cognitive.' This is essentially the view that modern cognitive science has arrived at with its ideas of the functional nesting of simple mechanisms leading to the gradual irreducible emergence of higher representational functionality through synergistic non-linear feedback mechanisms at the boundary between chaos and order.

Spinoza also makes it clear that the *epistemic aspect* of the attribute of Extension is an *external* point of view from which one conceives or perceives of the world entirely as if the indwelling essence of reality were exclusively *extended* in matter and its inter-relations. This is because outsides and inter-relations are all we can see when we take things apart and view them from outside their own immanent causal existence (see Figure 67, below). The interpretation herein makes it clear how every mode of Substance can and must be independently conceived under one or the other attribute as each mode necessarily has an internal and external experience or point of view from which it can be conceived *of* and perceived, and—corresponding to its degree of excellence—from which it can itself, conceive and perceive.

Attribute Parallelism: Connected Isolation and the Explanatory Gap

As Matthew Stewart says in *The Courtier and Heretic* [[my comments]] "The place to look for the unconscious part of the mind, then, is not in a fictional, hidden mind, but in the gap between the idea of the body that constitutes the mind and the body itself" [[i.e. the "explanatory gap"]] (p172). In other words, the human mind (the "idea of the body" or the idea that the body has), as epistemic and representational, emerges from the body itself as ontic, but both stratified ontic and epistemic aspects of attribute-neutral modality of the body are subject to the vertical bisection of the twin attributes, Thought and Extension, since holonic nucleation, and the polarity of the within and without, occurs at all levels of the body, ontic and epistemic (recall Figure 65, p503).

The dual (within/without) aspect necessarily inherent in the formative and descriptive (ontic and epistemic) essence of all modification quite simply accounts for the *exact* "order and connection" that both the "modes of thought" and the "modes of extension" adhere to (see Figure 67, below).

"The order and connection of ideas is the same as the order and connection of things"[i¥] and simultaneously it explains why the two attributes must function in parallel isolation from one another; this is because as a localization you can't simultaneously be outside the mode, viewing it under the aspect of Extension, and inside the mode as the intrinsic experience itself.[ii] Or more simply put, you can't be both outside and inside yourself at the same time.[iii] However, Spinoza also says, "thinking substance and extended substance are one and the same substance, comprehended now under this attribute, now under that. So, too, a mode of extension and the idea of that mode [[a "mode of thought"]] are one and the same thing, expressed in two ways."[iv¥] The "idea" of the mode, as a modification of the attribute of Thought, *is* this intrinsic existence or the experience of being the mode itself.

The gap of attribute parallelism at the epistemic level exists because of the necessary distinction between the two basic modes of conception/perception—the within and the without—manifesting at the epistemic level as the fundamental *descriptive* protocols (subjective/objective) with their intrinsic limits as an emergent or transcendent interface. To cross this gap the best one can do is to view both attributes separately and pseudo-simultaneously (i.e. intermittently shifting ones attention between the two, time-slices), for example watching a TV monitor of an active brain scan of the mental states one is in while he watches his own brain scan. However, the two views—now feeding back into each other limiting both states simultaneously to an interlocked existence—are still essentially separate and must be correlated through the knowledge of what one is watching from the outside vs. how it feels on the inside.

Ultimately, Spinoza says, "…in the universe nothing is granted, save substances and their modifications,"[v¥] therefore, with only one Substance (the ONE-ALL of The Infinite or simply Emptiness) in existence, every modification of an attribute is essentially a modification of Substance, comprehended and expressed now through one attribute and now through the other (from within or without), but as we have seen, never both

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[i¥] *Ethics I*, Prop. VII.

[ii] A key is presented here to disabling the homuncular regress by abandoning the notion that the experience of consciousness necessitates an experiencer. They are one and the same thing but occasionally the experience includes a feedback function we call "self-consciousness."

[iii] Of course this further depends on the aperture or scope of your definition of self which can be as flexible as one wants, and can extend beyond Extension to Substance itself thus revealing the polarity and unity of this duality. It is the control of this aperture that opens the communication lines between free-will and determinism.

[iv¥] *Ethics II*, Prop. 7

[v¥] *Ethics I*, Prop. 6, Proof.

simultaneously for any given mode.[i] This ultimate connection, in the formative protocols of modification is the unity behind the polarity and separation, or parallelism, of the attributes.

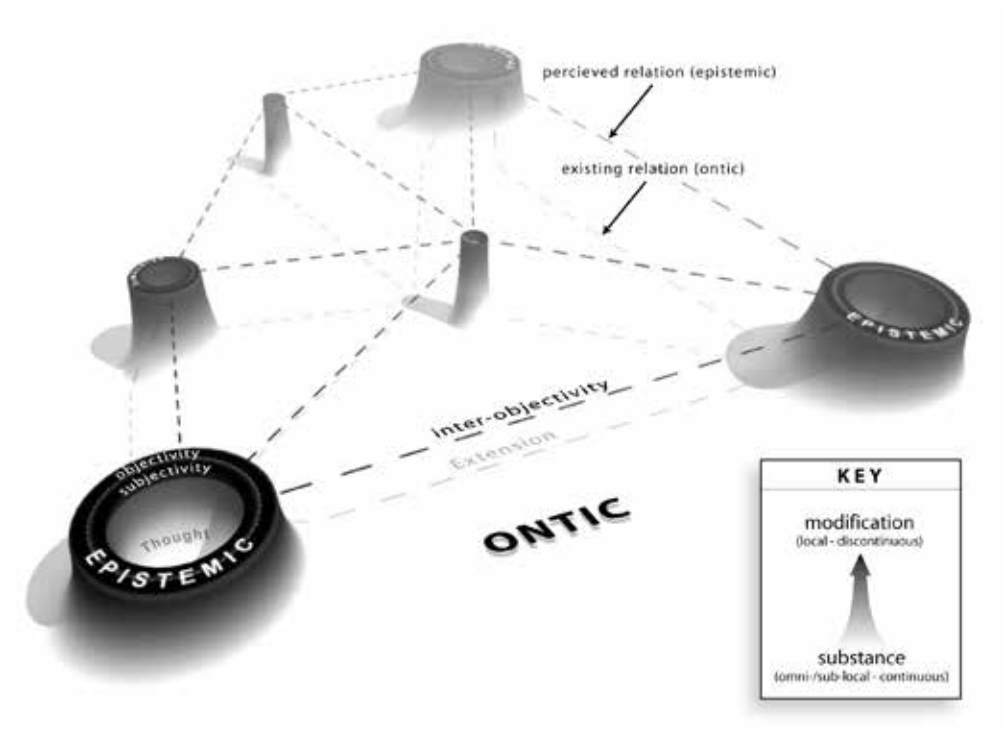

Figure 67: Attribute parallelism:
All "modes of thought" and "modes of extension" are ultimately modes of Substance conceived under each attribute respectively because "…in the universe nothing is granted, save substances and their modifications." The real relational unity underlying the parallel duality exists, therefore, at the ontic level as modifications of Substance.

The Problem of the Attributes Revisited

More specifically, the problem of the attributes is a problem of conflating and collapsing (con-fusing) the two undifferentiated orthogonal polarities of the ontic/epistemic and Thought/Extension (or subject/object). These two

[i] …unless perhaps one realizes the fundamental symbiotic unity beneath the perceived/conceived duality of subject and object in the emergence of the sensory/mnemonic interface (see the coming section, Emergence, Mnemonic Primitives, and the Symbiogenesis of Subject and Object, p528).

polarities,, recall, are ultimately found on the I/T omni- and uni-axes, respectively, with their respective interfaces in the transitive-plane and the spheroidal boundary. There is an ontic aspect to the attributes in the "formative protocols," and the attributes exist whether perceived *through* or not. As the fundamental polarity of boundary—the duality of finite unity—the two attributes, existing in the nucleated holonic ontic substrate from which the epistemic emerges, are naturally prior to emergent and nucleated perception and conception. And naturally the ontic aspect (the formative protocols) of this fundamental polarity of bounded form is necessarily perceived *through* the *a priori* "descriptive protocols" of the epistemic.

The mistaken reading of the attributes is the assumption that objectivity and subjectivity—the twin aspects of cognition, representation and the epistemic—are both subsumed under the *attribute* of Thought. ***The attribute of Thought, it must be clear, is not the common notion 'thought.' Objectivity is the epistemic level of the attribute of Extension and subjectivity is the epistemic level of the attribute of Thought.*** The "crossroads" of the two polarities—the attributes and the ontic/epistemic—arises at the emergent monadic interface of every cognitive/representational holon or mode, but the distinction must be kept from collapsing into a con-fusion between the omni- and uni-axes of the ontic-epistemic and the subject-object polarities, respectively.

"Transcendental Empiricism" and the "Cogito of the Dissolved Self"

Because the cognitive holon is necessarily a transcendent interface prior to experience of any kind, empiricism itself is necessarily a transcendent function. This is the essence of Deleuze's notion of "transcendental empiricism." Beneath the empirical is the sub-empirical; beneath the representational is the sub-representational; and beneath the epistemic is the ontic. All of these, however, including the ontic itself (in all its various names), take place in the relative world of form, as opposed to the ineffable absolute scope.

Empiricism itself—in its collective or multiple aspect—takes place at a transitive-plane, between the infinite immanence and transcendence of the I/T omni-axis. In its individual aspect, it takes place on the transcendent interface of the cognitive holon itself, between the infinite immanence and transcendence of the I/T uni-axis. Empiricism is not, it must be noted, identical with objectivity. This is because observation can take place in both internal and external directions; both subjective and objective. The science of psychology is a great example of subjective empiricism in action—with all its limitations and successes.

This individual interface is the reductive goal of the Cartesian "cogito"; "I think therefore I am." But the attempted reduction of relative knowledge to

the absolute scope takes us not into the certainty of any of the truths of form outside the self, but to an absolute certainty of only oneself—the solipsistic self-absolute because the only thing the self can know absolutely is the representational interface itself. All else is projection.

Through the principle of absolute reversal, however, of taking the self-boundary to the absolute, it dissolves its other and fades into the omni-non of nihilipsism (self-annihilation). If there is no other, there is no self—just as in the omni-local if there is no distinction between one location and all others, there is no location referenced at all. Ultimately we come to the annihilation of the self-distinction and boundary itself with the elimination of polarity. This is the "cogito of the dissolved self," roughly.

SECTION 3: THE POLARITIES IN ACTION, AND A RESOLUTION OF THE "HARD PROBLEM"

The Roles of Extension

Extension as Transitive Expansion

Spinoza's use of the term 'extension' comes from a long line of tradition ending with Descartes who conceived of it as synonymous with volume; a combination of the measurements of width, height and depth. How does one measure or perceive volume? As we have seen in the EOTC of number and operation,[i]* one begins by identifying a unit of reference for setting the relative scale of measurement—ideally a highly stable and uniformly replicable physical object, like a meter-stick—and then one uses this unit to measure relative distances in terms of multiples or divisions of the unit. The key point to understand is that these distances are *always* relative to the scale of choice, and in turn, this scale must be relative to the organism doing the measuring. Consequently it is the finite cognitive holon—a form already transcendent from the Emptiness of immanence—and the limits and range of its perceptual modifications (sensory systems), which are the ultimate transcendent referent by which all scales must be set for the purposes of perceiving and measuring transcendent extension. And it should be clear that no such finite or indefinite objective process can ever reach the infinite either in terms of extent or resolution (transitive or immanent, respectively).[ii]

Even though Spinoza's extended Substance is fundamentally continuous (recall our principle of Nondual Rationalism; infinite division equals indivisibility), extension—as a relative conceptual, perceptual and metrical concept—does not descend into the immanent causation or infinite-divisibility/indivisibility[iii] within the continuity. Rather it must remain a strictly transitive or transcendent (trans-biased) concept based on the set limit or range of scale centered on the basic unit itself; otherwise every smallest distance would be conceived/perceived as a compounded infinity

[i]* See, The Holarchical Unfolding of Number and Operation, p306.

[ii] This is why, as Leibniz discovered, neither the multiplicative infinite nor the divisive zero are true numbers.

[iii] At the absolute level these two (infinitely-divided and indivisible) are identical.

and all sensory propagations would descend into Zeno's trap of indefinite division. In such a case their transitive motion would be arrested, shunted into the infinite immanence within and never to return. An object or wave in natural uniform motion perfectly illustrates the transitivity of extension which is always *external* (emergent and transcendent) to the immanent continuity within all conceivable "needle-sharp points"[i]. This exclusion of the infinities of scale (which are embedded in the concept of continuity), is the transitivity and transcendence of extension (see Figure 68, below)

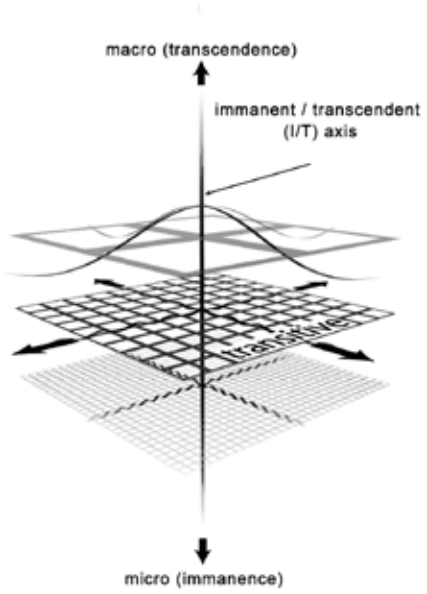

Figure 68: Extension and the I/T Axis: This is the I/T omni-axis illustrating the transitive-planes of resonance abstracted from the continuous spectrum of frequencies. The macro direction on this VL-axis zooms out and the micro zooms in to new resonance scales of extension. In reality all the scales are spatially superimposed, coexisting and emergent together, but they must be separated in this transitive rendering in order to get a better understanding of the separation in perception, measurement and even in resonant harmonic interaction. This demonstrates the transitive aspect of extension as centered on, and orthogonal to, a common position (scale) on the I/T omni-axis. The coordinate of the relevant "plane of extension" on the I/T-axis is determined by the scale of the interrelating object components (units) in resonance with the interface components (sensory mechanisms and sub-components) of the perceiving mode.

Extension as it Relates to Perception

Extended observability is always *external* to the interfaces of both the observer and the observed and it is always in relation to the vastly limited sensory scale of the observer. In this sense, the epistemic level of extension (objectivity) is based on emission or *reflection* of sensory modifications, such as acoustic or optical wave-forms. The ontic level of extension, on the other

[i] A term borrowed from Gerald Lebau which fits with Bucky Fuller's "Operational Mathematics" by adding extension and boundary (and the corresponding nuclear polarity) to every conceivable point, rendering "infinitely small" ultimately an oxymoron (see SpinbitZ).

hand, is based on the reflection of actual bounded forms from each other, as opposed to their merging. This is because the ontic transitive-plane—the foundation for agglomerative forms of evolution and complexity—is dependent on the self-identity of "simplest bodies," as Spinoza puts it, or "monads" in Leibniz's terminology. The attribute of Thought, on the other hand, is founded on the refraction or self-focusing and self-collecting of various energies, in both epistemic and ontic forms (subjectivity and self-reinforcement or homeostasis, respectively).

The external perception/conception of 'extension' *is* objectivity because sensation must originate in modification at an emergent, and thus finite or bounded, level. Even when objectivity dissects an object of inquiry, thus extending its range of observability into the components of this object, it always does so from the outside of these individualized and exposed components—and indeed always from outside the original self-stabilized, integral and emergent organization which it might disrupt in the act of dissecting observation.

Objectivity can thus never attain the perspective or experience of being the subjectivity of the object of perception (see Figure 69, below), except when subject and object are one and the same mode and one perceives the symbiogenesis of subject and object in the self-focusing sensory/mnemonic interface itself. This is the essence of the isolation, parallelism and polarity of the attributes (recall Figure 67, p512) and it gives rise to the unbridgeable, epistemic, 'explanatory gap' between the two protocols of description—subjectivity and objectivity (or mind and matter)—which finds its logical unity in the immanent causation of the Substance/Emptiness from which all bounded forms (including the interface) are emergent.

Conceiving and perceiving through the attribute of Extension is therefore the transitive outward conceptual (mental/metrical) radiation from a cognitive interface impinging on the external surfaces of other nuclei or nuclear-agglomerates (objects, patterns, brains, or cognitive holons) always within the same scale or region of *resonance* (e.g. visible light) rather than transcending infinitely up or down the I/T axis. The singular point of view—or more precisely, the nuclear interface of observability—is intrinsic to the concept of extension as it sets the resonant scale of perception.

Throughout the entire visible universe we sense only those events whose propagated disturbances resonate with our sensory mechanisms. We see objects, planets, stars and galaxies only because—like our own sensory mechanisms—within their structuring they contain atoms or molecules whose electronic shells emit or reflect waves within the narrow band of our own evolved and technologically augmented sensory receptive frequencies. This then acts as a filter for the perception of both spatial and temporal universal patterning relevant to the survival of the organism (recall Figure 68, above, p 516). The universe, therefore, appears far emptier and less orderly and structured than it otherwise would. This is because the

quantized nuclear interfaces—such as the concentric shell-patterning of planets, stars and galaxies[i]—with emitted and reflected frequencies beyond and beneath the scope of the augmented human spectrum—are entirely undetectable and invisible to us in our present state.[ii]

[i]This universal self-similar or fractal patterning can be seen on all scales, from the electron shells of the atom (mapped with Schrödinger's equation) to the structuring of the stellar systems (mapped with Bode's Law). The possible mechanisms for this patterning are explained in Sorce Theory (www.anpheon.org)

[ii]We are constantly expanding our range of perception through technological augmentation. A great example is the "Terahertz gap" in the spectrum of detectable em-waves between infrared and microwaves which is just beginning to be opened by technological means offering whole new realms of observational capabilities such as seeing through walls and enhanced medical imaging. There is simply no end in sight to the expansion of our perceptual range and no reason (except for current limitations of "Standard" theory) to suspect an absolute barrier.

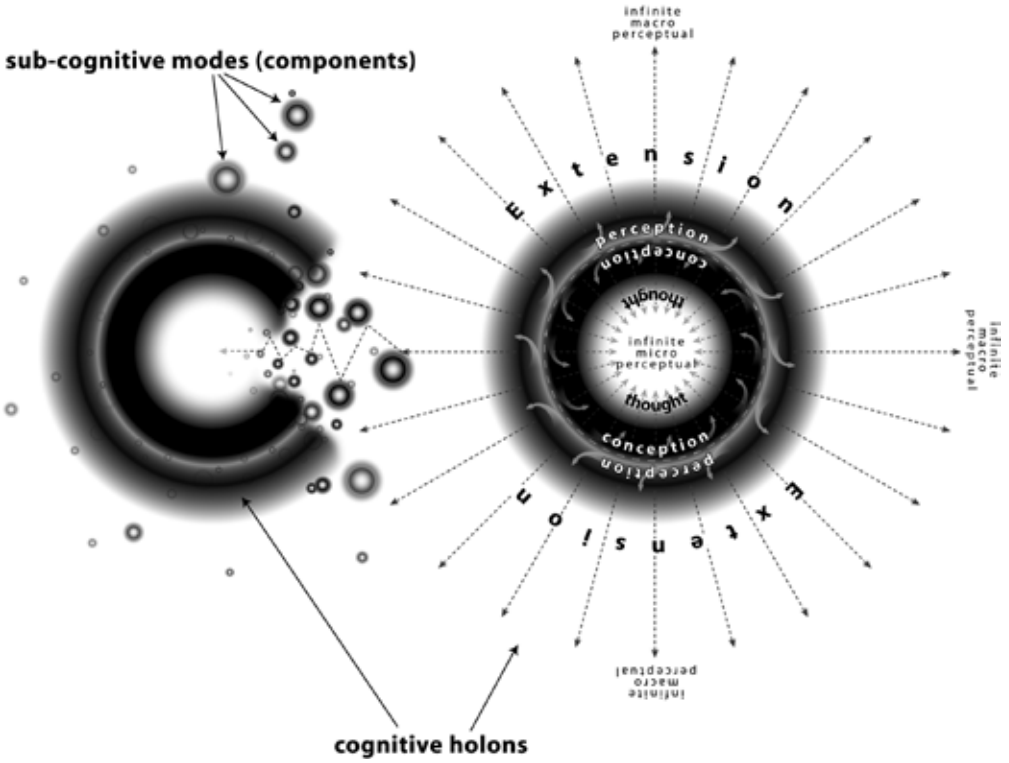

Figure 69: The Cognitive Holon and the Subject/Object Interface with Immanence and Transcendence:
Perception is a subject/object resonance within a limited domain of frequencies (transitive plane) on the infinite VL-axis of scale (I/T axis). The white background without and within each mode corresponds to those frequencies of resonance which are beyond and below (respectively) the perceptual reach of the cognitive holon, i.e. beyond the sensorial realm. The black rings denote the self-stabilized homeostatic integrated emergence of intrinsic, self-focused 'experience' ("qualia") from within the mode. The larger spheres are the modes of cognition such as a human brain/mind with its corresponding epistemic duality of objectivity and subjectivity. Note that when the arrow of extension tries to touch the inner 'experience'—the inner black rings—of an outer mode, the best it can do is convert the insides into outsides in exposing the inside components to an outside view. One may object that we can receive sensory data, such as active brain scans, directly from the insides of living brains, but this is still a view of the inside from outside the mode in question. One cannot ever experience the within of anything through sensations from without, without transforming that without into that within. One must *be* the focal point of the energies to *be* the experience of the subjectivity in question.

Extension as it Relates to the Essence of Substance

Substance, in Nondual Rationalism, is a continuum of "infinite division equals indivisibility" and "infinite determinism equals indeterminism," and thus it is ultimately scale-independent and trans-foundational. This does not mean, of course, that the aspect or attribute of transitive extension, orthogonal to the VL-axis of scale, is exclusively an epistemic, sensory, perceptual or metrical phenomenon. This conclusion would be to neglect the ontic aspect included in Spinoza's definition of an attribute. As we will see, the relevant (sensorially resonant) transitive "plane of extension"[i] is meaningfully grounded in an absolute (physical, actual or ontic) position on the I/T omni-axis, and it is from this emergent or transcendent foundation that the morphological gradient of "excellence" gets its structural basis. Substance may be "formless" or emptiness in its *logically prior* and eternal absolute scope aspect (Substance is "prior to its modifications"[ii¥]), but in the field of time—i.e. in the broken symmetry of actuality/activity or existence—Substance appears to be entirely inhomogeneous and actively modified/modifying in self-similar patterns on regular, intermittent and unlimited scales. This may be the real meaning of quantization as found by modern physics at the sub-atomic, atomic, planetary, stellar, and galactic levels and its possible mechanisms are beyond the scope of this book.[iii]

The nature of actuality appears to be such that at specific recurring intervals on the I/T omni-axis its modifications become homogenized or granulated at specific "identical"[iv] sizes (e.g. interstellar H atoms) to form levels of unit-patterns, or "matter-unit substrates."[v]* These substrates of interrelating homogenized units (Spinoza's "simplest bodies" or Leibniz's

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[i]Keep in mind that the plane itself is a spatial abstraction from the continuity of the spectrum of frequencies and thus it really represents a continuous range in a volume of frequencies set by the cognitive mode itself which in turn is based at the deeper ontic level of the "matter-unit substrate" or "islands of resonance."

[ii¥]*Ethics I*, Prop. 1.

[iii]Possible mechanisms for this quantization can be found in Sorce Theory, and covered at a general level in my article *Sorce Theory: Unlocking the Basement*. The galactic-scale quantization is seen in the recent conclusions of the "quantization of redshift" based on observations initially conducted in the early 1970's by William G. Tifft, of the University of Arizona. See for example http://www.ldolphin.org/tifftshift.html This also may cast a deep problem onto the Big Bang cosmogony which is based on the Doppler interpretation of the Hubble redshift as its sole mechanism. If—as has been shown in other studies such as the "fingers of God" anomaly—there are serious problems with the Doppler interpretation of redshift, then there must be another mechanism other than the fantastical idea of the expansion of the entire Universe, whose extent, for all we know, may be infinite.

[iv]This is the field of "simplest bodies" denoted by Spinoza which evolves into "composite bodies" along the gradient of "excellence." Depending on the meta-unit homogeneity (density/pressure gradients/patterns) of the next substrate level from which they form.

[v]* See, Trip-Reset: "Simplest Bodies" and the Self-Similar Kosmos, p586.

"physical monads"), our atoms and their quantized variants[i] (the ~92 naturally occurring chemical elements), generate resonant levels or planes of morphological complexity, stability and agglomerative possibility enabling the architectural complexification necessary for the "spontaneous" evolution of the cognitive holons. These transitive planes of stability/possibility ("islands of resonance") on the I/T omni-axis are then the "ground" of the morphological gradient of cognitive complexification towards Spinoza's cognitive "excellence."

From the relative simplicity at the level of the homogenized/granulated matter-unit substrate, to the monstrous architectural complexity of the cognitive holons—this gradient forms the essence of the ontic/epistemic polarity; the distinction from which the conceptual/perceptual (mental/metrical or epistemic) aspect of extension (the fundamental descriptive protocol) can expand its range of inter-relating, representational action upon the ontic level in order to create what we call "physical science."

The immanent scales of these transitive planes are set by the uniformity of the interrelating and interacting matter-units and their resonant frequencies. Of necessity—as immanent causal aspects of univocal Substance—they are perfectly, causally and harmoniously integrated in all directions on all imaginable and unimaginable omni-relational transitive, immanent and transcendent axes. It is an infinite causal self-similar holarchy in which each immanent level enables the quantized existence of the next transcendent level and vice versa. At the descriptive or perceptual level, however, these orthogonal 'planes' function quite independently as individual cognitive holons come into or out of sensorial resonance with them, expanding, contracting or shifting their miniscule range of perception, through birth, death, technology or evolution.

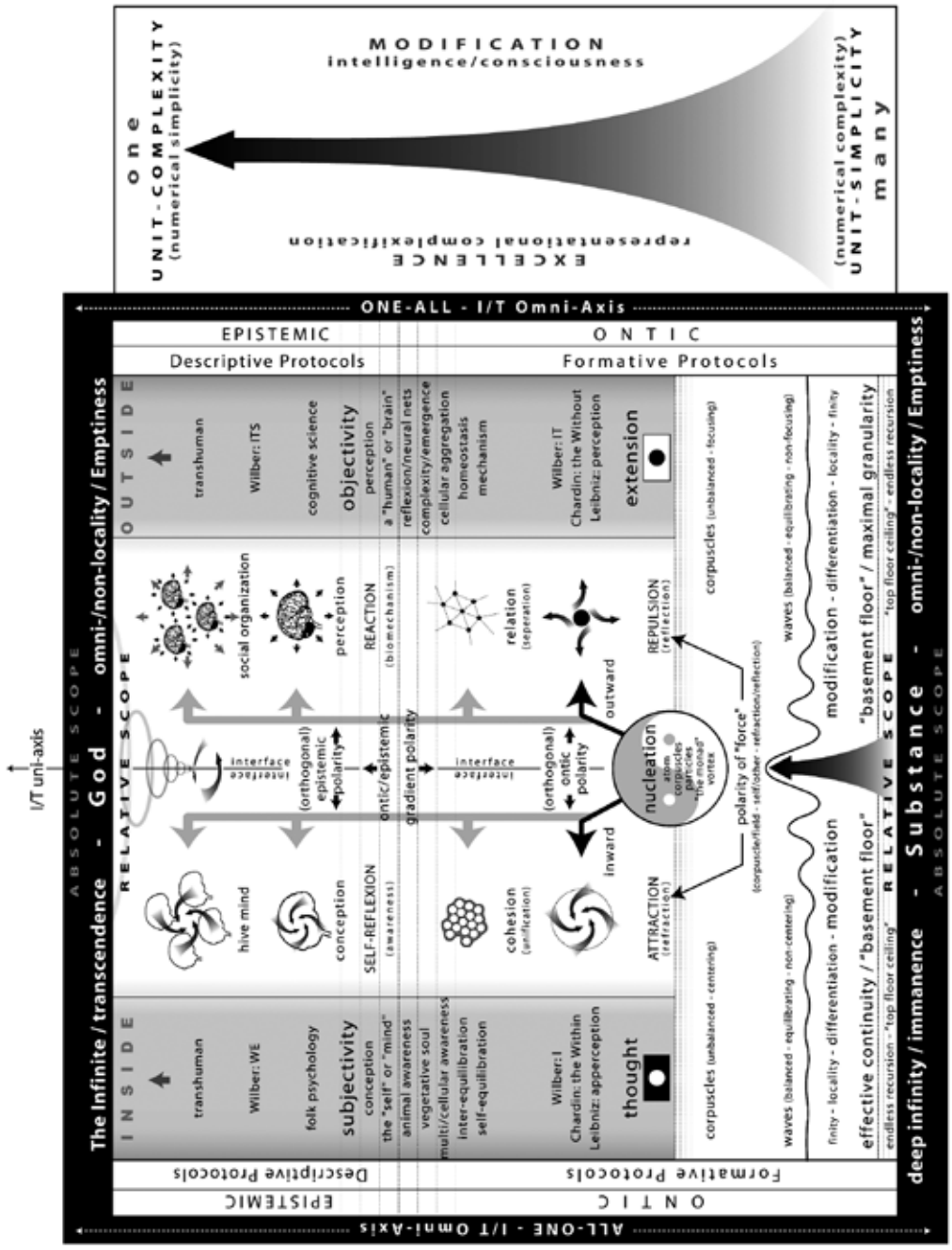
At our scale of sensory resonance, we observe this homogenized, interrelational, extensional orthogonality most clearly in the ubiquitous molecular/atomic matrix of hydrogen (the root atom) that is known to fill interstellar and intergalactic space.

As highly complex compounded modifications, we are born from and into this self-similarly modified extensional orthogonality on the chemically and biologically active surface of a terrestrial nucleus—a planetary biosphere. This emergent I/T-orthogonality or transitivity inherent in the immanent, continuous active essence of Substance—in its formative aspect to nucleate into transitively inter-relating self-similar islands of resonance—is extension at the ontic level as it causally interrelates the nature of

[i]Sorce Theory and quantum physics demonstrates the likelihood that the subatomic particles are either variants of the simplest atomic nucleus, such as protons and neutrons, or they are relatively short-lived wave-forms and resonances such as solitons, breathers or other complex and dynamic morphologies that do not 'own' their own material, and thus collectively they form charged fields rather than composite bodies proper.

emergence, modal-complexity (excellence), perception-conception (the epistemic) and their respective forms of relation (ontic and epistemic). See Figure 70, below.

Figure 70: Duality Chasm: The Vista of the Expanded Crossroads:
This chart is a logical extension of Figure 65 (p503), but renders a more comprehensive view of the ideas given so far. Note that it includes conceptual links to the physical theory upon which this model is based, such as the inclusion of the single force ("sorce") and its bifurcation into the duality of force (all attraction and repulsion) in the distinction between reflection and refraction. Note also that there are many open spaces in the tentative listing of categories and descriptive and formative protocols. Because of the pervasiveness of these fundamental orthogonal polarities which are found in almost all known metaphysical systems, this chart is useful for the organization of many systems of thought


MODIFICATION
intelligence/consciousness
one
UNIT-COMPLEXITY
(numerical simplicity)
EXCELLENCE
representational complexification
(numerical complexity)
UNIT-SIMPLICITY
many
ONE-ALL - I/T Omni-Axis
EPISTEMIC
ONTIC
Descriptive Protocols
Formative Protocols
I/T uni-axis
ABSOLUTE SCOPE
The Infinite / transcendence - God - omni-/non-locality / Emptiness
RELATIVE SCOPE
INSIDE
OUTSIDE
transhuman
Wilber: WE
folk psychology
subjectivity
conception
the "self" or "mind"
animal awareness
vegetative soul
multi/cellular awareness
inter-equilibration
self-equilibration
Wilber: I
Chardin: the Within
Leibniz: apperception
thought
hive mind
conception
SELF-REFLEXION
(awareness)
cohesion
(self-fication)
ATTRACTION
(refraction)
interface
(orthogonal)
epistemic
polarity
gradient polarity
ontic/epistemic
interface
(orthogonal)
ontic
polarity
inward
outward
nucleation
atom
corpuscles
particles
"the monad"
vortex
social organization
perception
REACTION
(biomechanism)
relation
(seperation)
REPULSION
(reflection)
polarity of "force"
(corpuscle/field - self/other - refraction/reflection)
transhuman
Wilber: ITS
cognitive science
objectivity
perception
a "human" or "brain"
reflexion/neural nets
complexity/emergence
cellular aggregation
homeostasis
mechanism
Wilber: IT
Chardin: the Without
Leibniz: perception
extension
corpuscles (unbalanced - centering)
corpuscles (unbalanced - focusing)
waves (balanced - equilibrating - non-centering)
waves (balanced - equilibrating - non-focusing)
finity - locality - differentiation - modification
modification - differentiation - locality - finity
effective continuity / "basement floor"
"basement floor" / maximal granularity
endless recursion - "top floor ceiling"
"top floor ceiling" - endless recursion
deep infinity / immanence - Substance - omni-/non-locality / Emptiness
ABSOLUTE SCOPE
RELATIVE SCOPE
ALL-ONE - I/T Omni-Axis
EPISTEMIC
ONTIC
Descriptive Protocols
Formative Protocols

The Mind-Body Problem and the Symbiogenesis of Subject and Object

The Mind-body Problem as a Limitation of the Fundamental Descriptive Protocols

We have seen that both the descriptive protocols—subjectivity and objectivity—emerge from the morphological gradient of emergent "excellence" (with its polarity of formative protocols) into the representational realm of the epistemic. Thus both subjectivity and objectivity are finite (or indefinite) systems of relative knowledge about the relative and infinitely complex, intrinsic or extrinsic world of form, respectively.

In terms of Spinoza's Triune Infinite, taken as an "organizing principle" behind the *Ethics*, the attributes are the *aspects* of The Infinite (Substance), as seen from within or from without any particular modification. This morphological and polar explanation, then, gives a concrete reason why Spinoza only gave us two of the infinite, or unlimited attributes of God—a problem which has vexed Spinozists from the beginning.

With the concept of "the nucleation of observability" it has been pointed out that all systems of knowledge emerge at the sensory/representational (mnemonic) interface of a cognitive mode, and this emergence is always transcendent to a deeper level of immanence, on the I/T omni- or uni-axis. We have also seen this as the simple meaning of Deleuze's "transcendental empiricism" in that perception/conception always begins from a plane of immanence that is already necessarily transcendent or emergent from deeper immanence. Such an immanent plane, we have also seen, is necessarily, at the same time, a transitive-plane. Empiricism, therefore, being derived ultimately from emergent/collective perception, is necessarily inherently emergent or transcendental, conceived as a transitive plane on the immanent-transcendent omni-axis, for the collective of empirical data, and a spherical interface on the uni-axis, for the empirical surface of the individual.

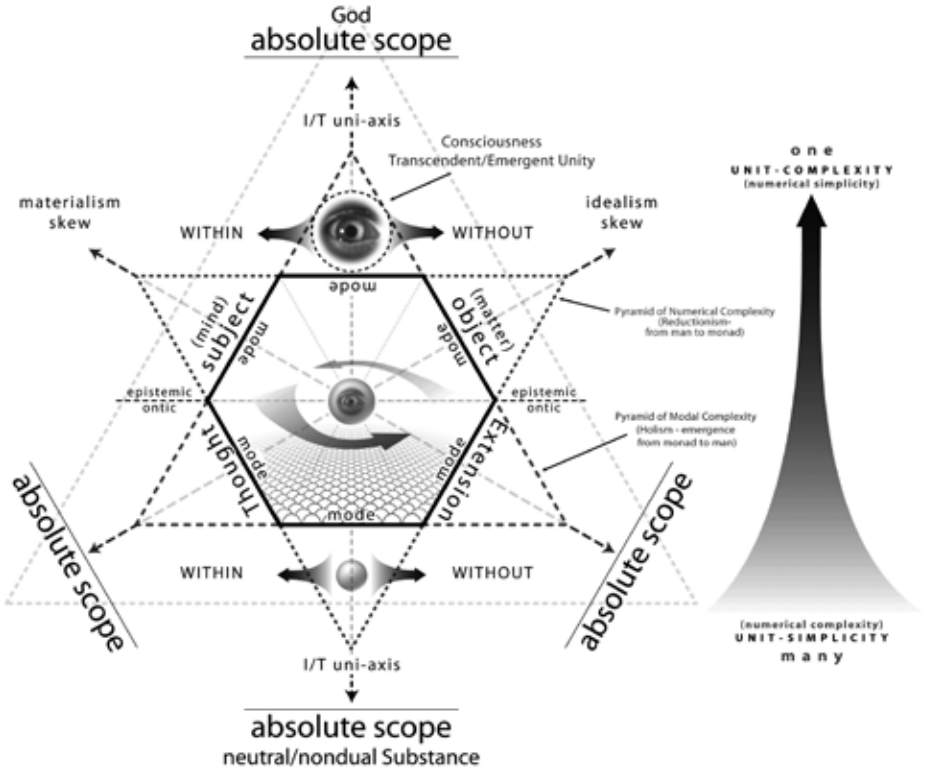


Figure 71: The Star of Complexity:
In this diagram we have several interfacing polarities. In the horizontal dimension, bisecting the left and right sides of the star, we have the polarity of the within and the without, respectively. From bottom to top we have the inversely overlapping polarities of complexity—holism vs. reductionism—where, in the upward direction, we move from whole to greater whole (holism), with the current culmination in the one of human consciousness, encompassing the simpler wholes of vast quantities of various simpler holons—atoms, cells, etc. From top to bottom, on the other hand, we have the polarity of reductionism, where we start with the massive numbers making up the whole of consciousness and move down toward one single atom. In the two skewed polarities we find the selection at the ontic level—pointing foundationally to the immanent pole of the absolute scope—deciding the skew of the epistemic level. If, for example, the objective is seen as the ontic, then this skews the ontic toward the attribute of extension, and the subjective suffers a reduction to it as the epistemic.

This finite emergent/transcendent representational surface of the cognitive/representational mode—emerging from the "infinite-divisibility equals indivisible" continuum—is a distinction between the infinities of the within and the without, and naturally this bounded interface shares the limits of all finite, bounded systems. At the very basis of this fallibilistic

view, then, is the common-sense notion that no finite system can encompass the infinite. In the Univocity Framework, recall, the infinite and the finite form a fundamental polarity—the polarity of polarity itself, where the relative scope projects its other, the absolute scope, to give it defining context.[i]* The infinite and finite are the quantitative aspects of the absolute and relative scopes; the core polarity of Substance and its modes.

According to this nondual-rational point of view, then, both the materialists and the idealists (or the Subjectivists and Objectivists) make a common mistake. They each fail to understand the proper role of the subjective and the objective as fundamental *descriptive* protocols in the epistemic and relative realm of inherently limited and fallible representational abstraction. They therefore each take one epistemic protocol or the other and erroneously project it down to the ontic level, toward the foundational absolute scope, in exclusion of the other (see Figure 71, above). This unbalanced view is akin to claiming that outsides can exist without (or prior to) insides or vice versa and that the entire universe is *ultimately* composed *only* of either the outsides or the insides of things.

When understood in this way, these two common views, in their various forms, become quite nonsensical because they each neglect the fundamental nondual principle of polarity, violating the Univocity Framework, as we have seen.

Materialism (or physicalism) is the view that objectivity (modified Substance as viewed externally through the attribute of Extension) is the fundamental point of view into which all others must reduce. Even further, it is the failure to recognize that objectivity is a point of view at all.[ii] This failure enables the ontic=objective absolutization of this relative view and the reduction of its symbiotic opposite. In the minds of the materialists, this view then becomes inherently infallible in principle (i.e. the finite is considered infinite or unlimited and the relative is considered absolute) and the materialist then claims that subjectivity is *fundamentally* unreal and therefore encompassable and replaceable by objectivity.

This is the view taken, in one form or another, by many scientists and philosophers such as Daniel Dennett, for instance, who has gone so far as to reject the notion (or maybe just an absolute distortion of the term) of 'qualia' (the 'what it's like' quality of mental states) entirely as inherently meaningless and replaceable by mechanical descriptions.[iii]

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[i]* See, "Vertical" Polarity: The Polarity of Polarity, p175.

[ii] As stated previously, this is because the meaning of "objectivity" has changed from the representation of external reality to the reality itself, the ontic. Now there is no corresponding word to denote its prior meaning and to balance the meaning of subjectivity.

[iii]Dennett's view on qualia, however, is quite justified from within the materialist's paradigm, and indeed it is useful to break the Cartesian dualistic spell. Dennett places great emphasis on demonstrating that the common, absolutized and mystified usage of the term qualia renders the

In his book *The Truth About Everything,* Matthew Stewart notes quite presciently that in materialism, such a reduction to man-made and arguably ideal laws discloses a polarity reversal[i]* in that materialism becomes an idealism when matter reduces to merely the ideal laws of physics. Indeed we can see this quite clearly in the operations at the empirical edges of physics where the function of the conscious observer and his descriptive protocols in the collapse of the wave-function is taken to be the reality itself. Stewart comically calls this problem "The Schmiderialism Principle"[ii]¥ and indeed it is a problem of mistaking descriptive (epistemic) protocols, subjectivity or objectivity for the formative, ontic or sub-representational level itself.

Similarly, idealism intuitively recognizes that objectivity has forced something critical out of the picture and so the idealists swing the other direction and project the *intrinsic* emergent aspect of modal existence, down to the absolute level, often rejecting any and all objective external descriptions, and even science itself in many cases. The idealists too fail to realize the emergent/transcendental nature of the epistemic mode (fundamental descriptive protocol) of subjectivity as inherently abstract and limited—as well as failing to understand the fundamental polarity and symbiosis of the two fundamental descriptive/representational points of view.

Both of these views, we can see, ultimately (when taken to their extremes) collapse into the "cogito of the dissolved self," the solipsistic reduction to the ontic-epistemic boundary of individual experience and the

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problem in Cartesian dualistic terms, his 'Cartesian Theatre.' Essentially Dennett is only denying that we *have* subjective experience in order to say that we *are* the subjective experience which is ultimately reduced to a "benign user illusion." The illusion of course, includes the self-diagnostic feedback function of self-reflexion.

Notice how the rephrasing from "*we have* subjective experience" to "*we are* subjective experience" disables the dualistic, subject/object, internal homuncular projection. His point is that we have let the common meanings of this problematic word 'qualia' disable the functioning of the "intuition pumps" or "heuristic bridges," used by the cognitive scientists, thus disabling the relative truths of cognitive science to work their way through the philosophy of mind. Since the explanatory gap is fundamentally unbridgeable, intuition or heuristics are then the only means of correlating the physicalist descriptions with the actual experience we know as 'qualia.' This means that if the word 'qualia' causes us to misunderstand the nature of the problem, and therefore causes us to fail to properly use the quite adequate heuristic bridges provided by cognitive science, then the term must be disabled in favor of a more correctly functioning word in order to render the problem workable. Perhaps Dennett could have gone the route of saying that we *are* qualia rather rejecting the word itself, but this would still not disable the collective connotative basins of attraction into typical and simplistic Cartesian dualistic notions that the word engenders. It is perhaps indeed more useful to just abandon a word and start fresh rather than insist that people use it in a new way.

[i]* See, Principle 4: Chord 3: The Principle of Absolute Reversal (PAR), p117.

[ii] Matthew Stewart, The Truth About Everything, p. 309

absolute reversal[i]* from this solipsism to the identical opposite omni-non of nihilipsism, when the absolute self dissolves and digests its defining other.

Emergence, Mnemonic Primitives, and the Symbiogenesis of Subject and Object

Spinoza's morphological gradient of 'excellence,' along with our cogito boundary, is the springboard for further reflection into the symbiotic subject/object polarity of the fundamental protocols emergent at both ontic and epistemic levels. As previously mentioned, self-stabilization cannot exist without an environment in which to stabilize; the self is defined by its interface with its other.

This appears to be true at all levels in the boundless holarchy, from "fundamental particle"[ii] to biological cell to animal awareness and to consciousness. In the genesis of intelligent biological homeostasis,[iii] the organism complexifies its inner structure to capture and abstract the intricacy and the encountered 'contingencies' of its environment in order to optimize its chances of survival through 'intelligent' reactions. Or as Deleuze might say, the organism enfolds the outside into the inside, in the convolutions of the vinculum of the self-boundary. In this symbiotic enfolding process the primitive seeds of both subjectivity and objectivity are born via an interdependent symbiogenesis of an internal and external environment separating, integrating and manifesting an emerging, evolving/involving (convoluting) and enfolding boundary (vinculum).

Subjectivity is dependent on objectivity because the complexity of the sensed, felt, reacted environment is the catalyst, source and template for its own ever-complexifying, enfolding interiorization and abstraction into 'mechanism' and 'function,' through the intrinsic problem-solving intelligence of evolution. This is what Maturana and Varela call "structural coupling," where "...a history of recurrent interactions [leads] to the structural congruence between two (or more) systems," (p75) but it is

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[i]* See, Principle 4: Chord 3: The Principle of Absolute Reversal (PAR), p117.

[ii] In Spinoza's view, "substance is prior to its modifications," therefore no particle can be fundamental in any absolute sense. The absolute fundamental is the ONE, infinite and continuous substance, i.e. the universe itself—and all else is but multiplication through division—a modification. However, in a forthcoming integration and interpretation of Leibniz's concept of the 'monad', there is a sense in which a pattern, in this case nucleation (for instance at the ontic level of "simplest bodies" or atoms) and its distinctive pattern of quantization (seen in the intra-atomic-electron orbits and in the structure of the solar system etc,) can be fundamental as the self-similar infinitely recurring pattern in the cosmos, the "matter-unit (see Sorce Theory). The absolute fundamental element of nature, however, is the One, infinite substance, i.e. the universe itself or the absolute scope. All else is but multiplication through division—a modification.

[iii] Spinoza calls the tendency or "endeavor" for each composite body towards self-preservation, its "essence."

important to note that what is coupled is not the environment and the interior of the organism, but the interior and the exterior of the abstract interface of perception itself. Objectivity, recall, is not the outside itself (i.e. the ontic), but the *outside view* of the epistemic. At the higher levels of morphological complexity—yet at the very rudiments of the emerging cognitive mode—this templating or subject/object calibration process (enfolding) generates what can be called the "mnemonic primitives," which are the defining feature of 'qualia' as the emergent, primitive-level subject/object interface (vinculum) itself; the raw percepts transcended-and-included in the higher forms of concept.

When a child is born into sensorial resonance with the world, it begins an intensive calibration process between its inherent pattern recognition, mnemonic and sensory structures and its resonant environment. This calibration process is the essence of memory, qualia and sensation in one enfolding interface between the within and the without. This is why the newborn infant, as it learns to see and interact with the world, generally forms and retains no memories that make sense as such to the adult, though they are 'remembered' in dismembered or distributive form as the primitives of the experience of qualia itself throughout conscious life.[i] The infant's root-level mnemonic pattern-recognition medium is still being formed and it is from this medium (or context) that all subsequent memories arise as further complexifications. The child's memories come into focus as s/he matures because part of that maturing involves the gradual development of the mnemonic sensory system itself, from the ground up.

At a basic neurological level the senses begin to 'memorize' or 'learn' (enfold) the abstracted relevant details and differentiations of reality (e.g. colors) as it resonates and interacts at the sensory-motor interface. It does this in order to generate distinct and differentiated responses to different stimuli as the basis for further higher-level, more abstract homeostatic cognition and interaction. Some of these responses—the mnemonic primitives—are the *learned* neuro-sensory patterns and differentiations (memories) that are reactivated every time the same basic stimulus is presented, such as the various frequencies of light impinging on the retina. Subjectivity itself (e.g. qualia), in this primitive form, thus emerges as the very experience of the cognitive mode, in active/reactive sensory/mnemonic resonance with its objective environment.

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[i] Every once in a while, these primitive memories can crop up in strange places, however, such as a memory I have which I can only attribute to the moment of birth. This memory of a thick squeeze and release, seems to emerge into my awareness very strongly and only at the still moments of crisis. In the embryogenesis of the concept, as one would expect, this primitive memory is very simple and undifferentiated. It is not even localized in space or time, but feels as if it were occurring throughout my entire body simultaneously, as if it weren't composed of subcomponents at all. It squeezes tight my entire, undifferentiated primitive body-"image" and suddenly releases. Perhaps, indeed, a primitive memory of the contractions or the moment of birth.

Mnemonic primitives, then, are a function of being *embedded* in a reality. They are the "what it is like" to be such an embedded cognitive mode in the act of perception/conception when this implicit calibration of sensorial memory becomes reactivated in its various intrinsic and extrinsic ways; subjective conception or objective perception, respectively.

The mnemonic primitives are the interface between the subjective and objective because they form the basis and representational foundation of each, and they are formed in the same embodied enfolding, convoluting, differentiating-and-integrating symbiogenetic process of the development of the interface between the within and without. Sensation or objectivity cannot exist without this subjective calibration and convoluting differentiation into the intelligent, cognitive, pattern *re*-cognition functions of perception. And the mnemonic primitives themselves are the very medium of more complex memories, as well as all subjective experiencing such as dreams, emotions, and self-reflection. Therefore, both subjectivity and objectivity are seen as different sides of the very same enfolded mnemonic interface and neither could exist without the other. They are necessarily formed in an entirely symbiotic and integrated process, and so they are symbiogenetic (see Figure 72, below).

In the complexification through evolutionary intelligence of this symbiotic subject/object interface into the more abstract representational forms of awareness and consciousness, more and more layers of abstraction are added to the pre-existing massive parallelism of the subconscious and preconscious homeostatic organism. Each new layer of abstraction, while more complex than the last, generally serves to consolidate and reflexively integrate the previous, more 'primitive,' layer until finally reaching the level of 'excellence' of the human being with its cerebral cortex and unitary experience or "stream" of consciousness.

The human organism has thus emerged, ultimately, at the level of abstraction of the linearity of language and the highly focused 'inner voice of consciousness' or 'the ***stream*** of thought.'[i] This emergent linguistic linearity enables functionality in the form of complex strings of internal meaning and external communication (both of which, in the same process at this higher level, are also symbiogenetic). Through a similar symbiogenetic feedback process, external communication and internal abstract conceptualization enables a further degree of rigor and linear complexification in the thoughts themselves (mnemonic complexes) due to the internal and external structure of the language in which the thoughts are functionally 'encapsulated' and reflexively conjured.

[i] Alan Watts calls this "spotlight consciousness" as opposed to the "floodlight sub-consciousness."

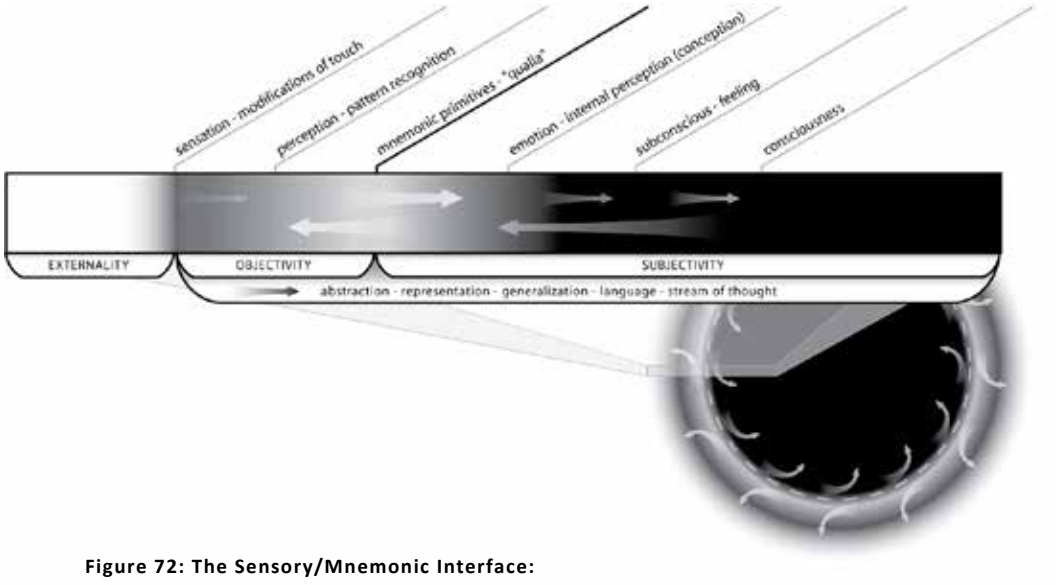
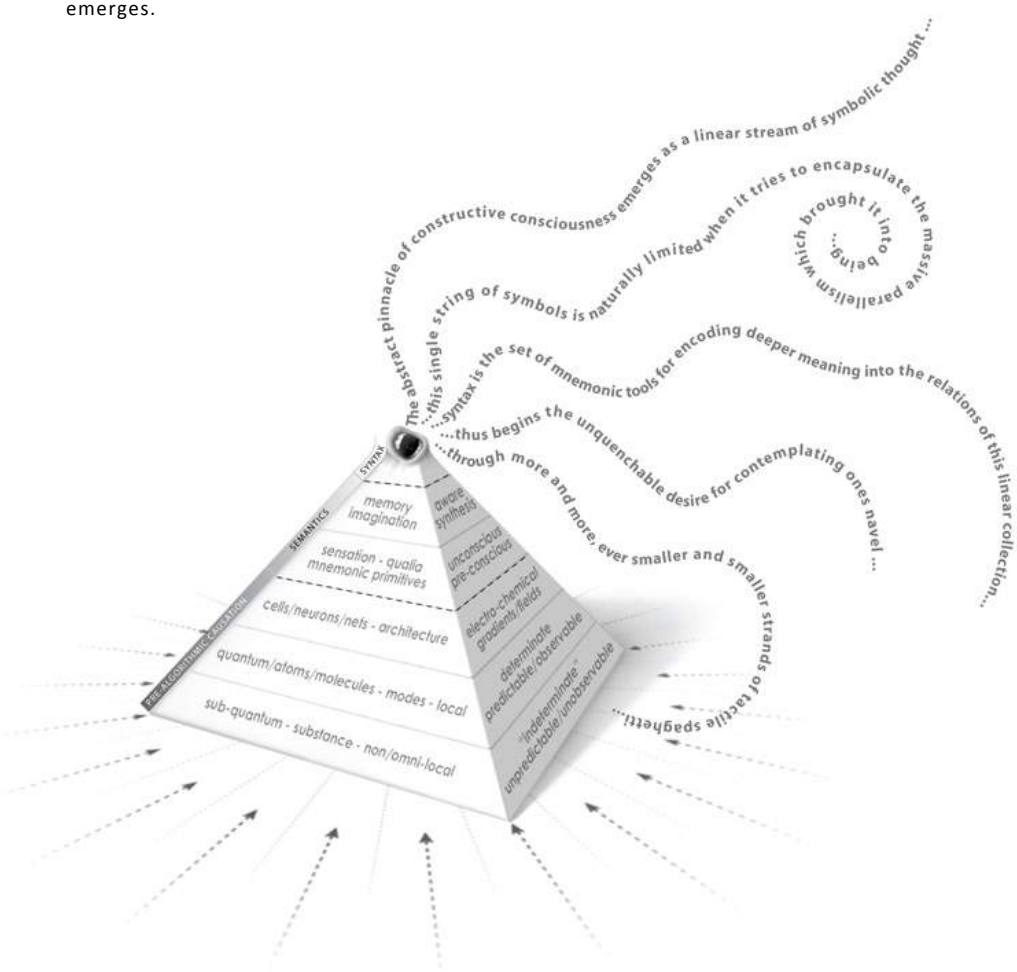


Figure 72: The Sensory/Mnemonic Interface:
A vastly over-simplified and generalized schematic of the symbiotic relationships between subjectivity, objectivity, internal and external reality. Objectivity is on the outside of the mode simply because it includes the external senses and thus mediates between real or ontic externality and subjectivity. Both subjectivity and objectivity get their epistemic grounding in the mnemonic primitives as the basis of representation through enfolding and embodied calibration with external reality via the evolutionary development of the senses. Note, however, that this diagram represents the areas in a linearly circumnuclear fashion, but in reality these areas are distributed throughout the brain in a highly complex and convoluted patterning, much more like a tree (or a rain forest) than a sphere. Note also that there are feedback circuits (arrows) in one form or another from all *represented and general* areas to all others and that consciousness plays a key role in both subjectivity and objectivity.

The linearity inherent in language comes at a price, however, because of its limited scope when confronted with the massive parallelism of its subconscious processes. This problem is captured in the central paradox of Artificial Intelligence which states, "systems simple enough to be understandable are not complicated enough to behave intelligently; and systems complicated enough to behave intelligently are not simple enough to be understood."[i¥] This problem is akin to raising oneself up by ones own bootstraps or trying to fit the area of a circle into its own circumference—or more appropriately in this case, trying to fit a whole pyramid into its very tip.

[i¥] George B. Dyson, *Darwin Among the Machines* (USA: Addison Wesley, 1997)

Figure 73: The All-Talking Mouth:
Consciousness can be visualized as the very tip of a vast pyramid of layers and layers of massively parallel complexity. Each new layer emerges as the abstraction, simplification, generalization and consolidation of the massive parallelism beneath it until at the apex of human thought we end up with linear, linguistic, abstract consciousness. This linearity, though very advantageous in the construction and communication of serially complex and rigorous thought, has its inherent limitations especially when it tries to encapsulate parallelism of even minimal complexity (just try to focus on 50 things at once, moving in different directions, and you will find all sorts of compromises must be made to even begin to approach to that figure). Therefore to simultaneously understand such complexity—where billions of billions of neurons (each composed of billions and billions of atoms) are connected by billions more synapses into densely packed, inconceivably chaotic dendritic thickets—one must rely on the deeper processes of intuition by letting go of conscious demands for a perfectly explicit linear and serial account of the vastly complex, massively parallel and entirely nonlinear causal foundation from which linear "one-track-mind" consciousness emerges.


The abstract pinnacle of constructive consciousness emerges as a linear stream of symbolic thought ...
...this single string of symbols is naturally limited when it tries to encapsulate the massive parallelism which brought it into being...
...syntax is the set of mnemonic tools for encoding deeper meaning into the relations of this linear collection...
...thus begins the unquenchable desire for contemplating ones navel ...
...through more and more, ever smaller and smaller strands of tactile spaghetti...
SYNTAX
SEMANTICS
PRE-ALGORITHMIC CALCULATION
memory imagination
aware synthesis
sensation - qualia mnemonic primitives
unconscious pre-conscious
cells/neurons/nets - architecture
electro-chemical gradients/fields
quantum/atoms/molecules - modes - local
determinate predictable/observable
sub-quantum - substance - non/omni-local
indeterminate unpredictable/unobservable

Identity Theory, Neutral Monism and Nondual Rationalism

As we have seen, the nondual-rational method of understanding the relation between the attributes (or aspects) of Substance and its modes is necessarily arranged in a *neutral* alignment. At the ontic level, neither Extension nor Thought holds any foundational dominance over the other, in exactly the same way that neither real outsides nor real insides can be conceived one without the other. This neutrality is the nondual and relative truth of the common "neutral monism" interpretation of Spinoza's system. The key difference, however, is that the typical monistic approach is commonly (though not always) a foundationalism, and the nondual-rational approach is explicitly trans-foundational, given its univocal framework and Vision-Logic Coordinate System.

Identity Theory, or Reductive Materialism, asserts that mental states are *numerically identical* to brain states, in other words they are absolutely one and the same thing. However, as the name implies, Reductive Materialism also says that subjective states are "intertheoretically reducible" (absolutely reducible) to objective, physical or material states. This means that, as the deeper reality, objective states hold an ontological or foundational primacy over subjective states, but both are accurate descriptions at their respective levels of abstraction—ontic vs. epistemic, essentially.

As we have seen, however, in Spinoza's system both subjectivity and objectivity are emergent at the *epistemic* level of the morphological gradient of 'excellence' as the categories of representation, or the fundamental descriptive protocols. Therefore, as an absolutization of a relative knowledge system—the epistemic objective at the expense of its inverse symbiotic partner the epistemic subjective—Identity Theory is thus an unbalanced view of reality. Indeed, it is a clear example of the objective-ontic shift, we discussed previously, where the objective has come to be identified with, or shifted toward the ontic itself, in the context of the successful scientific-objective relation with technological production and reality.

According to the interpretation herein, then, Reductive Materialism essentially says that all insides, though numerically identical to outsides, can and must be fundamentally reduced to outsides. In these reassigned terms this conclusion is clearly an absurdity; insides are not outsides and one cannot exist without (or be intertheoretically reduced to) the other. In Spinoza's system there is a strictly separated (and symbiotically conjoined) parallelism between the two attributes at all levels of the morphological gradient of excellence; this of course includes the epistemic. The two *views* of inside and outside, or subjective and objective are simply not equivalent, in fact they are symbiotic polar opposites, and therefore it is plain that they cannot be directly reduced or identified, one to the other.

Does this mean that Identity Theory and Spinoza's "neutral monism" or univocal Nondual Rationalism, share no relation? Spinoza says [my ***emphasis***], "Thinking ***substance*** and extended ***substance are one and the same thing***, comprehended now through this, now through that, attribute." This certainly seems to entail an identity of some kind, especially with the phrase "one and the same thing," which is actually used in the definition of Reductive Materialism given above. If the subjective mind and the objective brain are not numerically identical, then in what sense *are* they identical and in what sense *can* they be reduced, one to the other?

The key here is found in Spinoza's use of the term "substance." In Spinoza's neutral monism both subjectivity and objectivity are representative or epistemic aspects of reality, which is neither mind nor matter exclusively, but it has balanced *aspects* of both Thought and Extension (the within and the without as specifically defined herein). Recall that all modes conceived under each attribute, e.g. the "modes of extension" and the "modes of thought," are fundamentally modes of Substance.

Since the mind and the brain are modes of Substance *conceived* (episteme) and only differentiated under the attributes of Thought and Extension respectively, they are then considered and categorized as modes of the attributes under which they are currently conceived. Thus—due to the fundamental non-identity between the attributes—"mind" and "brain" cannot be numerically identical. An identity must therefore be drawn down through an attribute-neutral ontic channel to the modification of *Substance* itself, inclusive of both of its attributes, i.e. before the epistemic distinction between the within and the without of the singular mode itself is made (See Figure 74, below). It is this connection between the epistemic and ontic symbiogenetic polarities of the *singular* bounded or nucleated modes of substance, which provides the parallelism and the "exact order and connection" between the attributes as both descriptive and formative protocols.

Neutral Monism—as herein described in the context of Nondual Rationalism—inherits all of the positive aspects of Identity Theory and yet seems to escape all of its problems. It is said that one of the benefits of Identity Theory is its accordance with scientific accounts of the functioning of the brain. Neutral monism, however, is directly in line with, and accepts *both* fundamental descriptive protocols; the objective (cognitive science) and subjective (folk psychology), and it unifies them at a deeper, univocal ontological level, through the polarity of bounded form. Thus neutral monism naturally inherits this same positive scientific aspect because objectivity is a real perception of real modified Substance.

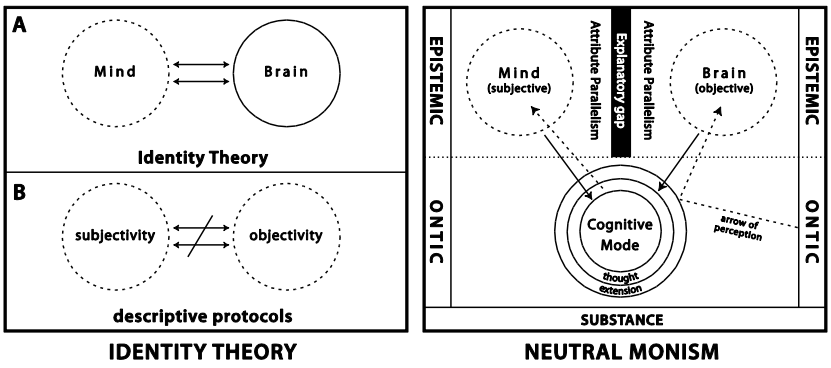


Figure 74: Identity Theory vs. Neutral Monism:
In Identity Theory a numerical equivalence is drawn between mental states and brain states ("Mind" and "Brain" herein). This is shown in box A. However, Box B shows the Spinozistic non-identity between subjectivity and objectivity as the emergent epistemic levels of the attributes as polar opposites. Since the mind and the brain are modes of Substance conceived (episteme) under the attribute of thought and extension respectively, then they are considered modes of the attributes. Due to the fundamental non-identity between the attributes then, mind and brain cannot be numerically identical and an identity must be drawn through a neutral channel. This is demonstrated in the "Neutral Monism" panel where the reduction from the two modes of the attributes is drawn (with the solid lines) down to the mode of Substance (the "Cognitive Mode") because "…in the universe nothing is granted, save substances and their modifications." The dotted lines indicate functions of the epistemic i.e. conception and perception and comprehension, whereas the solid lines indicate the ontic or absolute.

The main problem with Neutral Monism in its current connotations, however, is that it conjures up a foundationalism; a subject/object, mind/matter, attribute-neutral immanent/transitive-plane of *amorphous* goo, from which complicated modifications *somehow* emerge. This sounds rather similar to orthodox accounts of quantum mechanics, actually, as causation and determinism emerges from the level of "random" indeterminism existing just below the level of the atom. Neutral Monism as a foundationalism, as we discussed, would then be a tacit dualism; that of formlessness and form, the former generating the latter, but not vice versa.[i]*

A critical problem with Identity Theory, on the other hand, is the so-called "multiple realizability problem," the idea that many different brain states might all cause the same mind state. This problem arises from the

[i]* See, Univocity: Monism, Polarity and the Nondual, p156.

absolute nature of the concept of the numerical identity, because if the same mental state can be achieved in different physical/material instantiations and functional platforms, then there can be no one-to-one identity. The problem is that identity theory unwittingly claims an identity between physical states and mental states at the epistemic level of the objective and the subjective, rather than at the ontic level of the single mode of substance. In order for Identity Theory to hold, a weaker, or relative version of the identity must be maintained, and this weakens the reductive force and scientific feel of the model, already lacking any morphological or percept-based description of the identity, and also lacking the reason that its identity is now merely relative.

Since, however, the attribute-neutrality of neutral monism and Nondual Rationalism does not place a numerical identity between subjective mental states and their objective (externally observed) brain-state counterparts, no such definitional identity problems arise. The mental-states and the brain-states are fundamentally different states of description at the epistemic level and they are the relative and limited means to identify or observe states in the cognitive mode, arising as they do in dependent symbiogenesis of subject and object at (and as) the mnemonic interface of the cognitive mode. In Nondual Rationalism, such an absolute attribution of identity between these relative, limited, and fundamentally (indeed symbiogenetically) opposed descriptive protocols, is a violation of the Univocity Framework and the principles of nonduality.

As we will see, however, the main problem with Identity Theory/Reductive Materialism—and indeed a common problem with virtually every materialistic, physicalist or Objectivist theory of mind—stems from its foundationalist nature. The problem is that no strictly materialist theory can *fully* (i.e. absolutely) and explicitly[i] account for qualia. This is naturally because the relative world of description can't encompass the absolute scope of the infinite difference of the embodied experience of subjectivity itself. In other words, given the polarity of the attributes, and the fallibility of the fundamental descriptive protocols occurring at the relative and emergent level of awareness, qualia are naturally irreducible to an objective, physicalist description. The explanatory gap simply cannot *ultimately* be bridged. Instead, what we get in all of these theories is a promissory note that eventually science will evolve to the point that such an explicit account will indeed bridge this gap.[ii] While certainly such an

[i] Note that the 'explicit' is the essence of materialism and objectivity.

[ii] It is quite unclear how the explanatory gap ever could be bridged, however, except by relying at some level on an intuition pump or a causative means rather than an explicit objective explanation. Of course intuition pumps can already bridge the gap, provided one can properly operate the pump, but this is not at all satisfactory to the absolute aims of the physicalist or idealist programs which assumes one or the other descriptive protocols as absolute reality itself and thus needs perfectly

account will continue to evolve to the point that it feels adequate, it can never be complete and absolute in any nondual account.

Nondual Rationalism, however, makes no such absolutist claims about any necessarily finite and relative knowledge system, or about any of the relative concepts in its own system. The absolute scope, in Nondual Rationalism, is explicitly open and ineffable. No concept can land there and retain its own identity. Through the Univocity Framework, Nondual Rationalism systematically and categorically recognizes that no finite representational system can encompass the infinite and continuous immanent causation of Substance and it is therefore a categorical error to claim that any description ever could or even should be absolute. There can and need be no numerical identity between any descriptive protocols. The problem—which is indeed a problem pervasive to philosophy in general—is one of assigning absolute characteristics to the relative, and it is explicitly reconciled in the Univocity Framework.

Nondual Rationalism, as stated, recognizes that the explanatory gap will never be filled because it makes no sense to absolutize a relative descriptive protocol, especially if they are symbiotic polar opposites. In this same sense, no amount of detail to the sheet music will ever replace the sensory experience of the symphony, nor will any hyper-descriptive menu ever replace the real subjective experience of eating.[i]

This does not necessarily mean that our knowledge systems, based on the descriptive protocols, are useless or in any way diminished or limited in practicality; quite the opposite, in fact. They are indeed useful and entirely symbiotic and complementary because, as Spinoza says, they express the essence of Substance, which as we have seen, is infinity and unboundedeness itself, at the scope of the absolute and ineffable.

This relative knowledge is *real* and *direct* knowledge, but with the simple recognition that knowledge—as a bounded or indefinite manifestation of an emergent *interface*—is inherently, mediated, relative, abstract and thus finite and fundamentally incomplete. This means that the growth of objective science and subjective potentiality is unlimited, or indefinite, with no end in sight.

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explicit, logical and thus linear accounts of what, as is often the case, is inherently non-linear and irreducible.

[i] Unless of course the menu or the sheet-music can trigger complexly patterned neural responses in the brain itself and thus the explanatory gap is crossed not by explanation at the epistemic level, but by causation at the ontic level. This, of course, is not at all the problem in question, but rather a subversion to the level at which the problem must be addressed.

Concluding Note On Spinoza's Attribute Polarity

The Spinozistic exegetic rift has been resolved by the recognition that both the epistemic (Subjectivist) and ontic (Objectivist) readings contain essential aspects of a deeper morphological gradient. These two warring hermeneutic camps were also shown to be con-fusing (conflating the pre-fused distinction between) the two polarities and VL-axes of the ontic-epistemic and Thought/Extension. These two polarities, recall—the I/T omni-axis of the ontic-epistemic and the I/T uni-axis of the within and without, respectively—converge at the cross-roads of the mnemonic interface of the nucleated observer itself, and this undifferentiated distinction itself is a main cause of confusion in the literature.

Indeed once the enigmas, ambiguities and nominal confusions of the traditional exegesis have been explained through the deeper morphological analysis, Spinoza's crystalline metaphysical and epistemological structure is found to be quite robust and indeed resonant with our modern age of science.[i] This explanation has been used to elucidate the solution to a few problems in the philosophy of mind, but we have only scratched the surface of the possibilities inherent herein.

Nondual Rationalism—with its Vision-Logic Coordinate System, Univocity Framework, Fullerian "nucleation of observability," and Deleuzian "transcendental empiricism"—has been demonstrated as a simple and powerful resolution to the mind/body problem, and indeed this was a large part of Spinoza's original purpose once Descartes burst onto the scene with his problematic Substance dualism. In this interpretation of Spinoza, the mind/body problem is solved by logically placing it (the "explanatory gap") in the explanatory realm of the epistemic itself where it can naturally be seen as an incommensurability or non-identity between two symbiogenetic and fundamentally incomplete polar opposites—the fundamental "descriptive protocols" of subjectivity and objectivity—morphologically emergent from the deeper formative protocols of modal nucleation.

Through the topological analogy of "the nucleation of observability" and the concept of consciousness (the realm of the epistemic) as a finite emergent interface phenomena (the mnemonic primitives) between the infinities and perceptual irrelevancies of the within and the without, this subject/object descriptive discrepancy has been shown as a consequence of the fallibility of all finite representational systems. The fallibilism, knowledge-relativity, and Substance neutrality of the nondual-rational approach are therefore the keys to de-absolutizing and integrating the skewed materialist and idealist agendas, but this can only be understood and accepted through the realization of the epistemic and symbiogenetic nature

[i] For another excellent example of Spinoza's surprisingly modern and scientific views, see *Looking For Spinoza*, by Antonio Damasio.

of both the subjective and the objective descriptive protocols, in the orthogonal direction, cutting down through, the polarity of the ontic-epistemic, with its formative gradient of morphological and representational excellence.